

# **INDEPENDENT ORBITER ASSESSMENT**

## **ANALYSIS OF THE MECHANICAL ACTUATION SUBSYSTEM**

**30 NOVEMBER 1987**



MCDONNELL DOUGLAS ASTRONAUTICS COMPANY  
ENGINEERING SERVICES- HOUSTON DIVISION

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

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INDEPENDENT ORBITER ASSESSMENT  
ANALYSIS OF THE MECHANICAL ACTUATION SYSTEM

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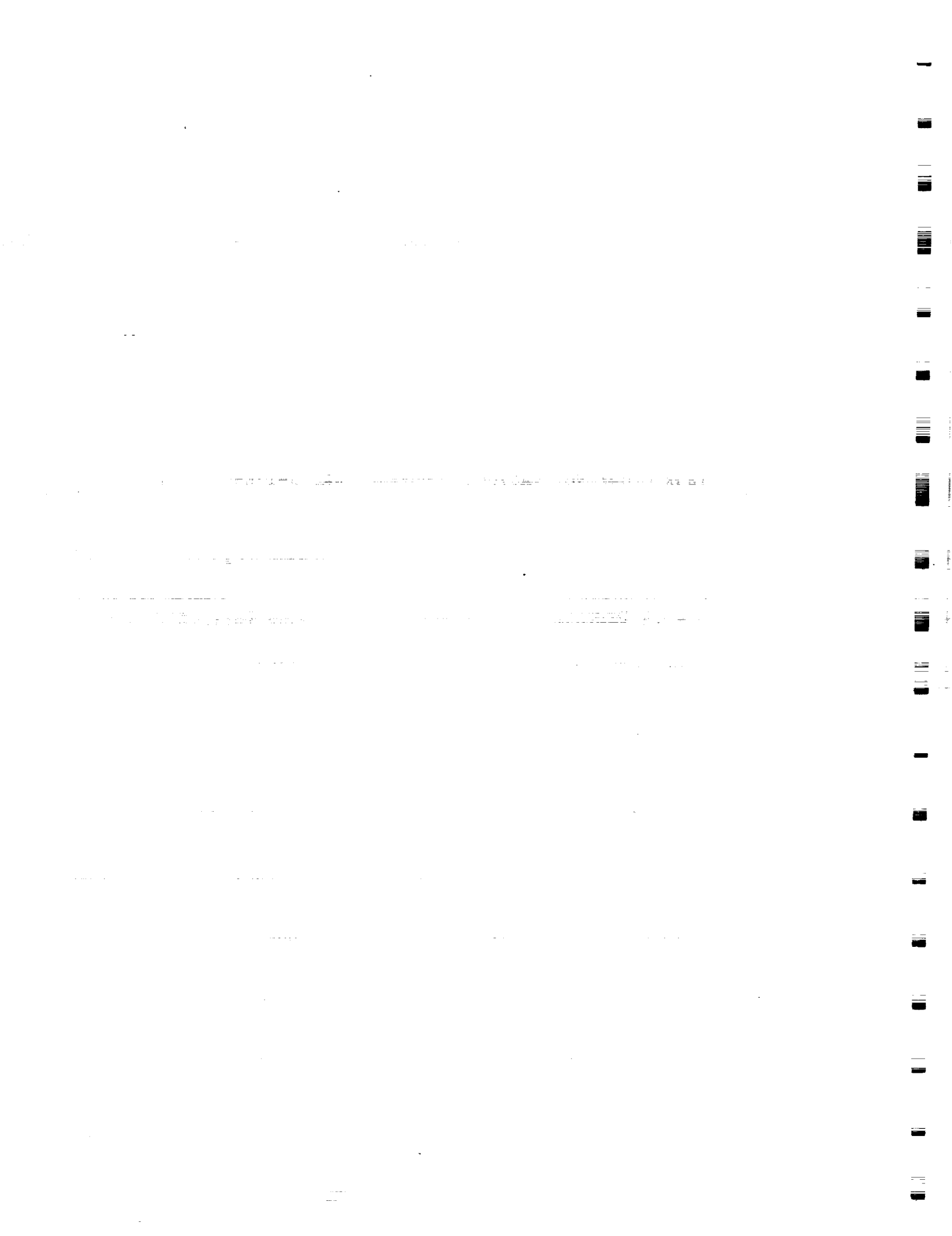
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# Independent Orbiter Assessment Analysis of the MAS Subsystem

## 1.0 EXECUTIVE SUMMARY

The McDonnell Douglas Astronautics Company (MDAC) was selected in June 1986 to perform an Independent Orbiter Assessment (IOA) of the Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL). Direction was given by the STS Orbiter and GFE Projects Office to perform the hardware analysis using the instructions and ground rules defined in NSTS 22206, Instructions for Preparation of FMEA and CIL, change 2, PRCBD 40107D, 28 March, 1987. The IOA approach features a top-down analysis of the hardware to determine failure modes, criticality, and potential critical items. To preserve independence, this analysis was accomplished without reliance upon the results contained within the NASA FMEA/CIL documentation. This report documents (Appendix C) the independent analysis results corresponding to the Orbiter Mechanical Actuation System (MAS) hardware.

The MAS hardware is required for performing critical functions of crew ingress/egress, air data parameter data acquisition, thermal protection of the elevon spar, fittings and External Tank (ET) umbilical cavities, communications support via the Tracking and Data Relay Satellite, target tracking during rendezvous and proximity operations, access for cargo to the payload bay, support for the ATCS and enables pressurized control of unpressurized compartments during transient pressure periods and environmental control during static pressure periods. Specifically, the MAS hardware consists of the following components:

- o Air Data Probe (ADP)
- o Elevon Seal Panel (ESP)
- o External Tank Umbilical (ETU)
- o Ku-Band Deploy (KBD)
- o Payload Bay Doors (PBD)
- o Payload Bay Radiators (PBR)
- o Personnel Hatches (PH)
- o Vent Door Mechanism (VDM)
- o Startracker Door Mechanism (SDM)

The IOA analysis process utilized available MAS hardware drawings and schematics for defining hardware assemblies, components, and hardware items. Each level of hardware was evaluated and analyzed for possible failure modes and effects. Criticality was assigned based upon the severity of the effect for each failure mode.

Figure 1 presents a summary of the failure criticalities for each of the nine major subdivisions of the MAS. A summary of the number of failure modes, by criticality, is also presented below with Hardware (HW) criticality first and Functional (F) criticality second.

Summary of IOA Failure Modes By Criticality (HW/F)							
Criticality :	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
ADP :	0	0	0	143	0	69	212
ESP :	6	0	0	0	0	1	7
ETU :	23	30	0	0	0	20	73
KBD :	3	6	1	111	42	37	200
PBD :	25	45	2	4	2	20	98
PBR :	0	0	0	14	0	22	36
PH :	1	0	0	12	3	5	21
VDM :	0	26	0	0	0	1	27
SDM :	0	0	0	6	0	5	11
TOTAL :	58	107	3	290	47	180	685

For each failure mode identified, the criticality and redundancy screens were examined to identify critical items. A summary of Potential Critical Items (PCIs) is presented as follows:

Summary of IOA Potential Critical Items (HW/F)						
Criticality :	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
ADP :	0	0	0	143	0	143
ESP :	6	0	0	0	0	6
ETU :	23	30	0	0	0	53
KBD :	3	6	1	110	42	162
PBD :	25	45	2	0	0	72
PBR :	0	0	0	0	0	0
PH :	1	0	0	10	3	14
VDM :	0	26	0	0	0	26
SDM :	0	0	0	0	0	0
TOTAL :	58	107	3	263	45	476

# MAS OVERVIEW ANALYSIS SUMMARY

MAS ANALYSIS SUMMARY			
CRT	#FMEA	#PCI	
1/1	58	58	
2/1R	167	167	
2/2	3	3	
3/1R	288	288	
3/2R	47	45	
3/3	188	0	
TOTAL	885	478	

KU - BAND DEPLOY		
CRT	#FMEA	#PCI
1/1	3	3
2/1R	6	6
2/2	1	1
3/1R	111	118
3/2R	42	42
3/3	37	0

ET UMBILICAL		
CRT	#FMEA	#PCI
1/1	23	23
2/1R	38	38
3/3	28	0

ELEVON SEAL PANEL		
CRT	#FMEA	#PCI
1/1	6	6
3/3	1	0

AIR DATA PROBE		
CRT	#FMEA	#PCI
3/1R	143	143
3/3	88	0

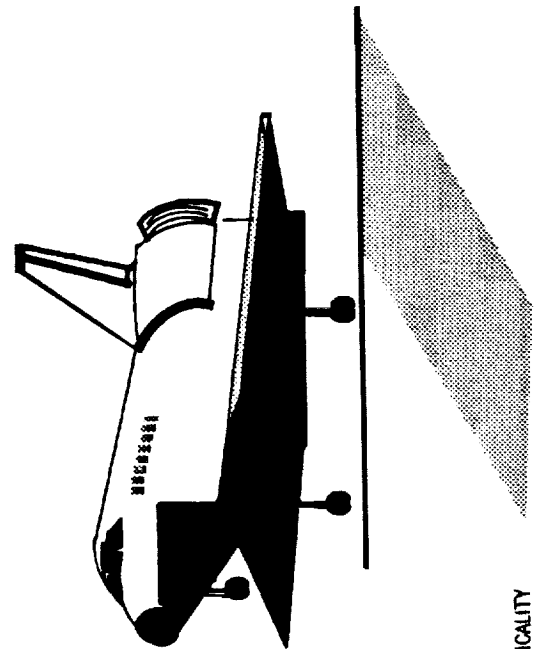
PAYLOAD BAY DOORS		
CRT	#FMEA	#PCI
1/1	25	25
2/1R	45	45
2/2	2	2
3/1R	4	0
3/3	20	0

PAYLOAD BAY RADIATORS		
CRT	#FMEA	#PCI
3/1R	14	0
3/3	22	0

PERSONNEL HATCHES		
CRT	#FMEA	#PCI
1/1	1	1
3/1R	12	10
3/2R	3	3
3/3	5	0

VENT DOOR MECHANISM		
CRT	#FMEA	#PCI
2/1R	26	26
3/3	1	0

STARTRACKER DOOR MECH		
CRT	#FMEA	#PCI
3/1R	6	0
3/3	5	0



CRT - CRITICALITY  
 FM - FAILURE MODE  
 PCI - POTENTIAL CRITICAL ITEM

Figure 1 - MAS OVERVIEW ANALYSIS SUMMARY

## **2.0 INTRODUCTION**

### **2.1 Purpose**

The 51-L Challenger accident prompted the NASA to re-address safety policies, concepts, and rationale being used in the National Space Transportation System (NSTS). The NSTS Office has undertaken the task of re-evaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the Orbiter FMEA/CIL re-evaluation results for completeness and technical accuracy.

### **2.2 Scope**

The scope of the independent FMEA/CIL assessment activity encompasses those Shuttle Orbiter subsystems and GFE hardware identified in the Space Shuttle Independent FMEA/CIL Assessment Contractor Statement of Work. Each subsystem analysis addresses hardware, functions, internal and external interfaces, and operational requirements for all mission phases.

### **2.3 Analysis Approach**

The independent analysis approach is a top-down analysis utilizing as-built drawings to breakdown the respective subsystem into components and low-level hardware items. Each hardware item is evaluated for failure mode, effects, and criticality. These data are documented in the respective subsystem analysis report, and are used to assess the NASA and Prime Contractor FMEA/CIL re-evaluation results. The IOA analysis approach is summarized in the following Steps 1.0 through 3.0. Step 4.0 summarizes the assessment of the NASA and Prime Contractor FMEAs/CILs to be performed and documented at a later date.

#### **Step 1.0 Subsystem Familiarization**

- 1.1 Define subsystem functions**
- 1.2 Define subsystem components**
- 1.3 Define subsystem specific ground rules and assumptions**

#### **Step 2.0 Define subsystem analysis diagram**

- 2.1 Define subsystem**
- 2.2 Define major assemblies**
- 2.3 Develop detailed subsystem representations**

#### **Step 3.0 Failure events definition**

- 3.1 Construct matrix of failure modes**
- 3.2 Document IOA analysis results**

Step 4.0 Compare IOA analysis data to NASA FMEA/CIL

- 4.1 Resolve differences
- 4.2 Review in-house
- 4.3 Document assessment issues
- 4.4 Forward findings to Project Manager

## **2.4 MAS Ground Rules and Assumptions**

The MAS ground rules and assumptions used in the IOA are defined in Appendix B. The subsystem specific ground rules were defined to limit the analysis to single-failed-parts for each failure mode. A subset of the "failure mode" and "causes" keywords were identified for the MAS team. This allowed for commonality in the analysis results.

### 3.0 SUBSYSTEM DESCRIPTION

#### 3.1 Design and Function

The MAS consists of the electrical power, display, control and mechanism hardware associated with the ADP, ESP, ETU, KBD, PLD, PBR, PH, VDM and SDM. Figure 2 shows this breakdown. More specifically, the MAS consists of the following components:

1. The Air Data Probe (ADP) consists of hardware required to sense atmospheric conditions and provide digital data to the GNC subsystem for display and control of the Orbiter during the Terminal Area Energy Management (below 14K altitude and Mach 5) and landing phase. Pressure data is provided below Mach 2.5 to compute angle of attack, acceleration, Mach/clean air mass velocity, equivalent and true airspeed, barometric altitude, and descent rate. Prior to this point the flight parameters are computed using inertial sensed acceleration data and a ground/airborne computed state vector. A temperature sensor on the head of the probe was designed to provide outside air temperature to be used to compute the true and equivalent airspeeds. This data is no longer used by the Orbiter GNC subsystem.

The Mechanical Actuation Assembly consists of a probe housing mounted to the Orbiter Inner Mold Line and contains the dual operational redundant three phase AC motors, reduction gear drive and mechanical linkage required to rotate the probe mast from its stowed position to its deployed position in the Orbiter air stream. A three position lever-lock switch for each probe allows the pilot or commander to deploy the probe and turn the heaters on if required. Deployment will occur within 15 seconds with two motors operating or 30 seconds with only one motor operating. The two motors for each probe are powered by separate Main AC buses so that any one main AC bus can be used to deploy at least one ADP. When the probe is fully deployed, a limit switch is closed which provides feedback to the Motor Control Assembly which then removes power from the motors. This same Motor Control Assembly signal which removes power from the motors also closes a set of relays that enable the heater function of the three position switch. All three heaters in any one probe are powered by the same Forward Power Controller in the Orbiter. In order to stow either ADP, a separate two position lever-lock switch must be activated to enable the stow position of the deploy/heat switch. When fully stowed, redundant stow limit switches will provide a signal to the Motor Control Assembly to remove power from the motors. Reference Figure 3 and Figure 4.

2. Elevons may be deflected from 0 to 40 degrees up (negative) and 0 to 25 degrees down (positive). As the elevons traverse the 65 degrees, the Elevon Seal Panels (ESP) track the elevons and limits heat flow to the elevon spar and fittings. There are 34 outboard and



inboard Elevon Seal Panel linkage mechanisms used to move the 30 Elevon Seal Panels. The linkage mechanism is attached to the elevon with a clevis and is attached to the Elevon Seal Panel with another clevis. Thus the mechanism is driven by elevon displacement and maintains appropriate clearances between the edge of the elevon and the Elevon Seal Panel over the 65 degrees of elevon movement. Reference Figure 5 and Figure 6.

3. The Orbiter External Tank Umbilical (ETU) Doors protect the aft Orbiter ET Umbilical Cavities from aerodynamic heating. The ET Umbilical Cavities contain the aft Orbiter/ET attachment points, the LOX and LH2 feedlines, and electrical connectors. The two ET Umbilical Doors are held open during ascent by two centerline latches.

These latches have to be released before the doors can be closed. Each door is closed by an actuator and mechanical linkages. On the inside of each cavity are three uplock latches which engage three uplock rollers on each door. The latches prevent the door from vibrating or re-opening. The Umbilical Doors are closed and latched by the crew manually except in the event of an RTLS or contingency abort when the closure sequence is done by the GNC software. Reference Figure 7 and Figure 8.

4. The Ku-Band Antenna is utilized to support communications via the Tracking and Data Relay Satellite or to support target tracking during rendezvous and proximity operations. The Ku-Band Deploy (KBD) Mechanism facilitates the Ku-Band Antenna as it performs these dual functions. The Deployment Mechanism consists of the Deployed Assembly, the Deployment Mechanism Subsystem and the Electronics Assembly 1. The Electronics Assembly is located in the Forward Avionics Bay 3A. All other components are located on the Starboard Payload Bay Sill Longeron at approximately Z=410, X=589, and Y=100. The Deployed Assembly consists of the Antenna Dish, Deployed Electronics Assembly, Gimbal Mechanism, Gimbal Lock Mechanism, 2 Lock Pins, 2 Motors and 2 Microswitches. The Deployment Mechanism Subsystem consists of an Actuator Assembly with 2 motors, differential and gear box and a Deployment Mechanism with 2 deploy/stow limit switches, housing, input/output shaft, balls, Hardstop and Jettison Assembly with guillotine wire cutter and Structural Separation Systems, and frangible nut/bolt. Reference Figure 9 and Figure 10.

5. The Payload Bay Doors (PBD) are comprised of left-hand and right-hand doors hinged at the Orbiter midfuselage and latched at the forward and aft fuselage bulkheads. The left and right doors also are latched along the top centerline.

The doors are 60 feet long. They are constructed of graphite/epoxy composite material. The left door weighs 2,375 pounds and the right door weighs 2,535 pounds. The right door is heavier because it carries the active centerline latch mechanisms. The closed PBD provide the aerodynamic fairing required for the midfuselage and complete the environmental envelope for the payload bay. The PBD react fuselage torsional loads, support their own flight and purge pressure loadings, and support the radiators.

There are 16 centerline latches, 8 aft bulkhead latches, and 8 forward bulkhead latches which hold the doors in the closed position. The latches are grouped in gangs of four. Each gang has its own pair of actuating motors, gearbox and drive mechanism.

The Payload Bay Doors Mechanical Subsystem consists of three parts. These are the Centerline Latch Mechanism, the Bulkhead Latch Mechanism, and the Door Drive. Reference Figure 11 and Figure 12.

6. The Payload Bay Radiator (PBR) Deploy Mechanism provides the capability to release, deploy, stow and latch the two forward port and starboard radiator panels on the Payload Bay Doors. The Deploy Mechanism consists of (1) a latch system and (2) a deployment system. The Latch and Deployment Mechanisms are located on the Payload Bay Doors while the Passive Latch Rollers and the Radiator Hinge Plates are on the radiator panels.

Each deployable radiator is secured to the PBD in the stowed position by six ganged latches. One latch PDU on each panel contains two 3-phase motors used to latch or release the six latches/panel simultaneously. PDU motor output drives, via torque shafts, three rotary actuators on each panel. As the torque shaft rotates, the rotary actuator arm is displaced 53 degrees. This rotational displacement drives two latch hooks, connected to the actuator arm by push rods, bellcranks and links, to the latch or release state.

The Radiator Deployment System consists of PDUs (one per side), torque shafts, rotary actuators (two per panel), deployment cranks and connecting links. Deployment PDUs, torque shafts and rotary actuators are basically the same as in the Latch System except for rotational displacement of the rotary actuator which is 92 degrees during deployment operations. This rotational displacement is applied to a deployment crank attached to the output arm of the Rotary Actuator, which drives the Radiator Panel to a deployed or stowed state. A deployment mechanism disconnect feature allows for manual disconnect of the Deployment Crank by EVA crewman in the event of a failed radiator. Reference Figure 13 through Figure 20.

7. The Personnel Hatches (PH) allow crew and service personnel ingress and egress capability to the Orbiter. There are three hatches, the Ingress/Egress Hatch, which allows access to the Orbiter, and two Airlock Hatches, which allow access to the airlock and payload bay. All three hatches are on the middeck and are of a similar design.

Each of the three hatches consist of the following hardware: Actuator, Hatch Crank, Latches, O-Rings, and Purge Ports. In addition to the above hardware the Entry Hatch has a 10 inch viewport. The crank will rotate 450 degrees clockwise and counterclockwise. When the crank is rotated the actuator opens and closes the latches. The Entry Hatch has 18 latches and the Airlock Hatches have 6. These latches pull the hatch flush with the bulkhead and the O-rings form an airtight seal (see figure 24). The Purge Ports equalize the pressure between the two sides of the hatch. This allows the hatch to be easily opened. Reference Figure 21 through Figure 24.

8. The Vent Door Mechanism (VDM) enables pressure control of unpressurized compartments during transient pressure periods and environmental control during static pressure periods. There are eighteen doors which the Door Mechanism actuates electromechanically. The doors provide pressure and environmental control for the Forward RCS, Forward Fuselage Plenum, Mid Fuselage, Payload Bay, Aft Fuselage, Vertical Fin, OMS Pods and Wheel Wells. The Door Mechanism consists of 24 independently powered three-phase AC motors, connected via a differential gearbox and torque shaft/slip clutch to bellcranks, linkages, rod assembly with bolts, nuts, washers, cotterpins, microswitch position indicators, etc. Reference Figure 25 through Figure 27.

9. The Startracker Door Mechanism (SDM) enables an aperture in the orbiter skin on orbit in the Y & Z axis and provides protection for the Startracker and compartment during ascent and entry. The two doors are actuated electro-mechanically. Each Door Mechanism consists of two independently powered three-phase AC motors connected via a differential gearbox/train, actuator output and limit switches to either the Y or Z door. Reference Figure 28 and Figure 29.

### **3.2 Interfaces and Locations**

The MAS interfaces with many onboard Orbiter systems including the Active Thermal Control System (ATCS), Air Surface Controls used for guidance and control, Crew, Guidance and Navigation, Communication and Tracking, Data Processing System, Electrical Power Display & Control, Elevons, External Tank Umbilical Door, Guidance & Navigation, and Purge, Vent & Drain Doors.

The MAS hardware is located throughout the Orbiter and interfaces primarily with the structure, electrical power, display and controls. The Air Data Probe and Startracker Door are located forward of the crew cabin. Personnel Hatches provide ingress/egress to the crew cabin. Ku-Band Deployment Mechanism, Payload Bay Doors, and the Payload Bay Radiator Deployment Mechanism are located in the Payload Bay. Purge, Vent and Drain Doors are located on each side of the Orbiter. The Elevon Seal Panels are located on top of each wing. ET Umbilical Doors are on the bottom side of the Orbiter.

### **3.3 Hierarchy**

Figure 2 illustrates the hierarchy of the MAS hardware and the corresponding subcomponents. Figures 3 through 23 comprise the detailed system representation.

# MECHANICAL ACTUATION SYSTEM OVERVIEW

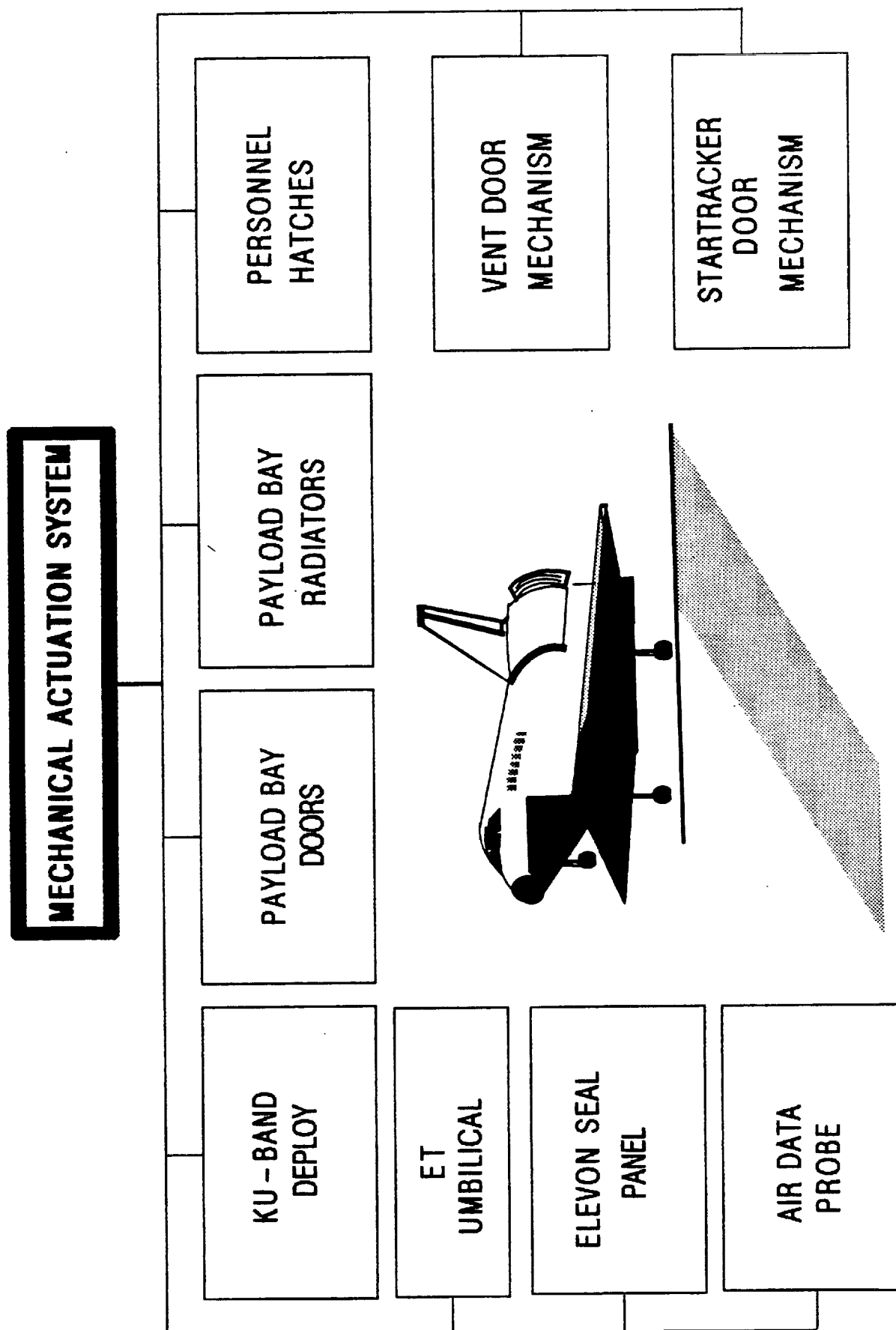


Figure 2 - MAS SUBSYSTEM OVERVIEW

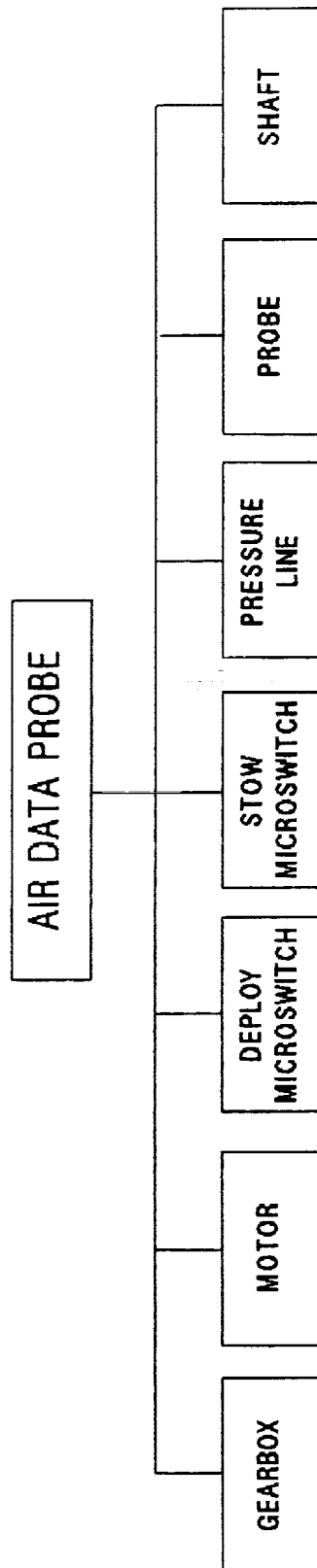


Figure 3 - AIR DATA PROBE FUNCTIONAL DIAGRAM

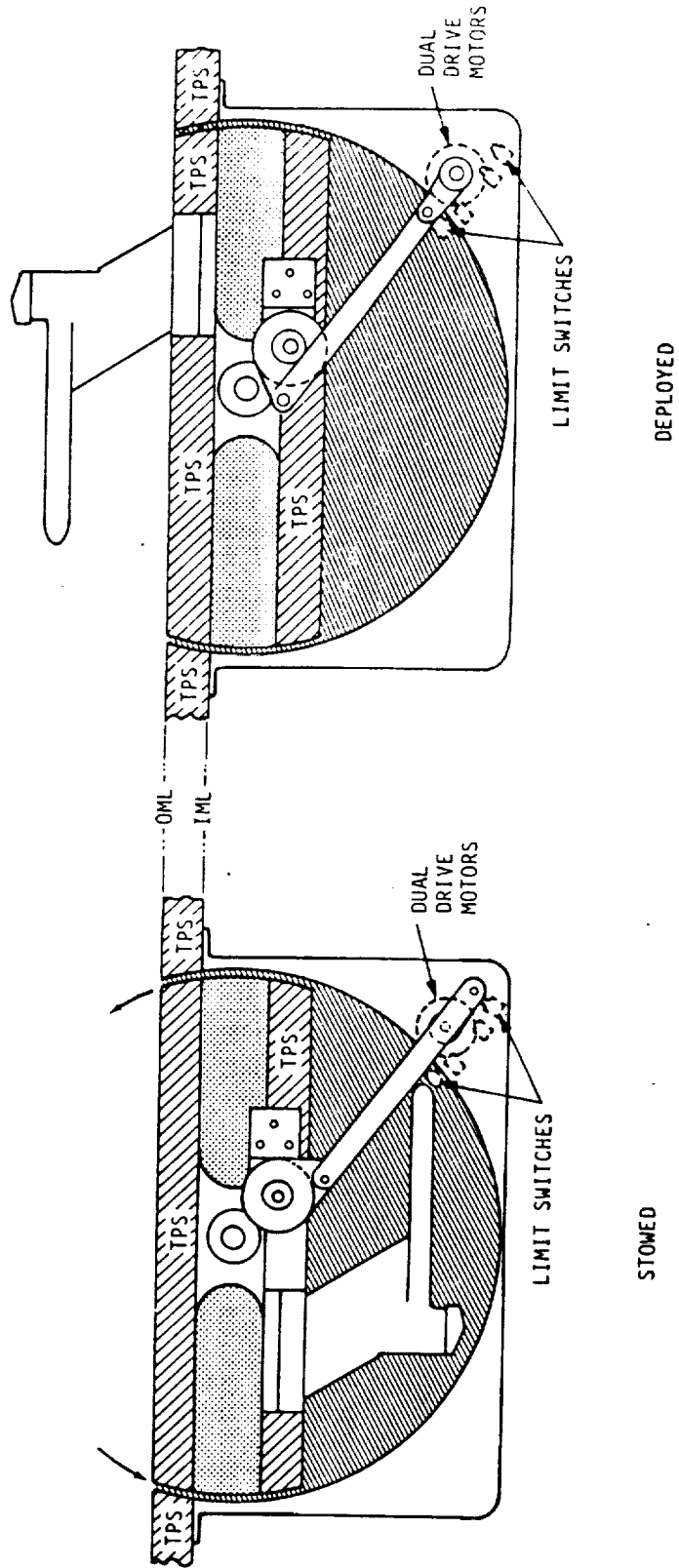


Figure 4 - AIR DATA PROBE

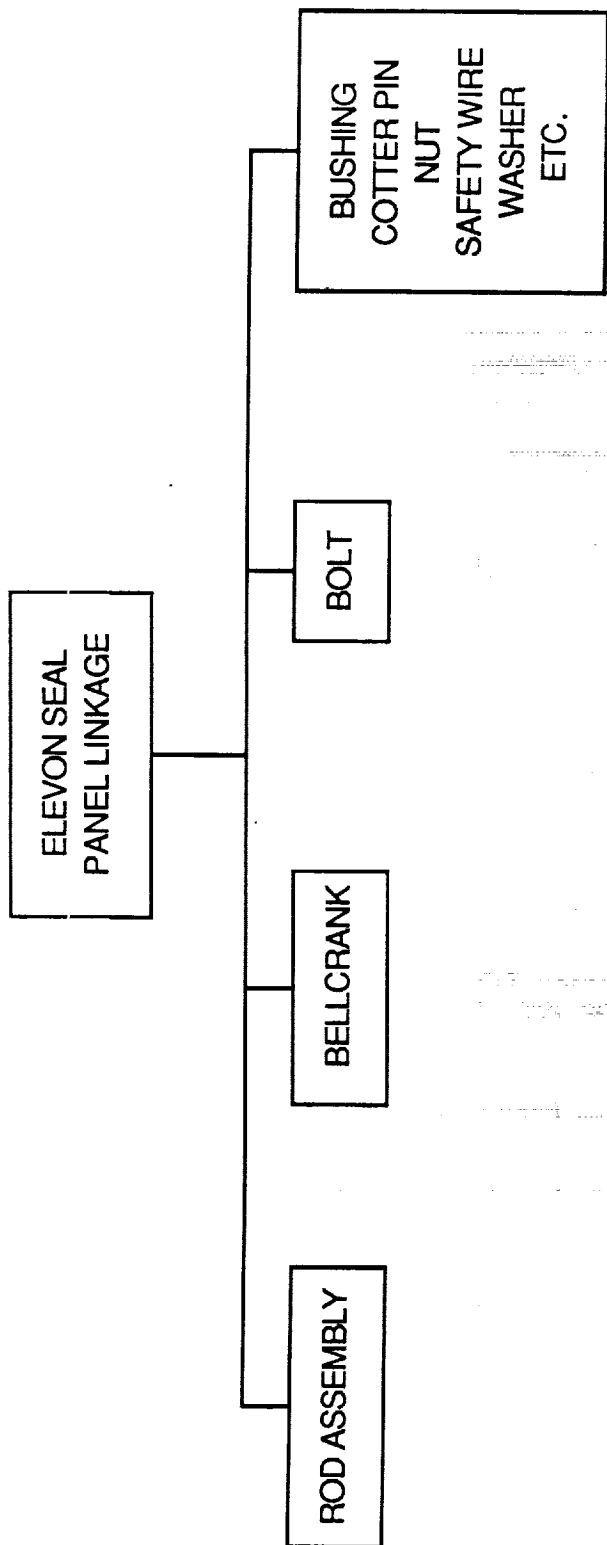


Figure 5 - ELEVON SEAL PANEL LINKAGE



# ELEVON SEAL PANEL LINKAGE

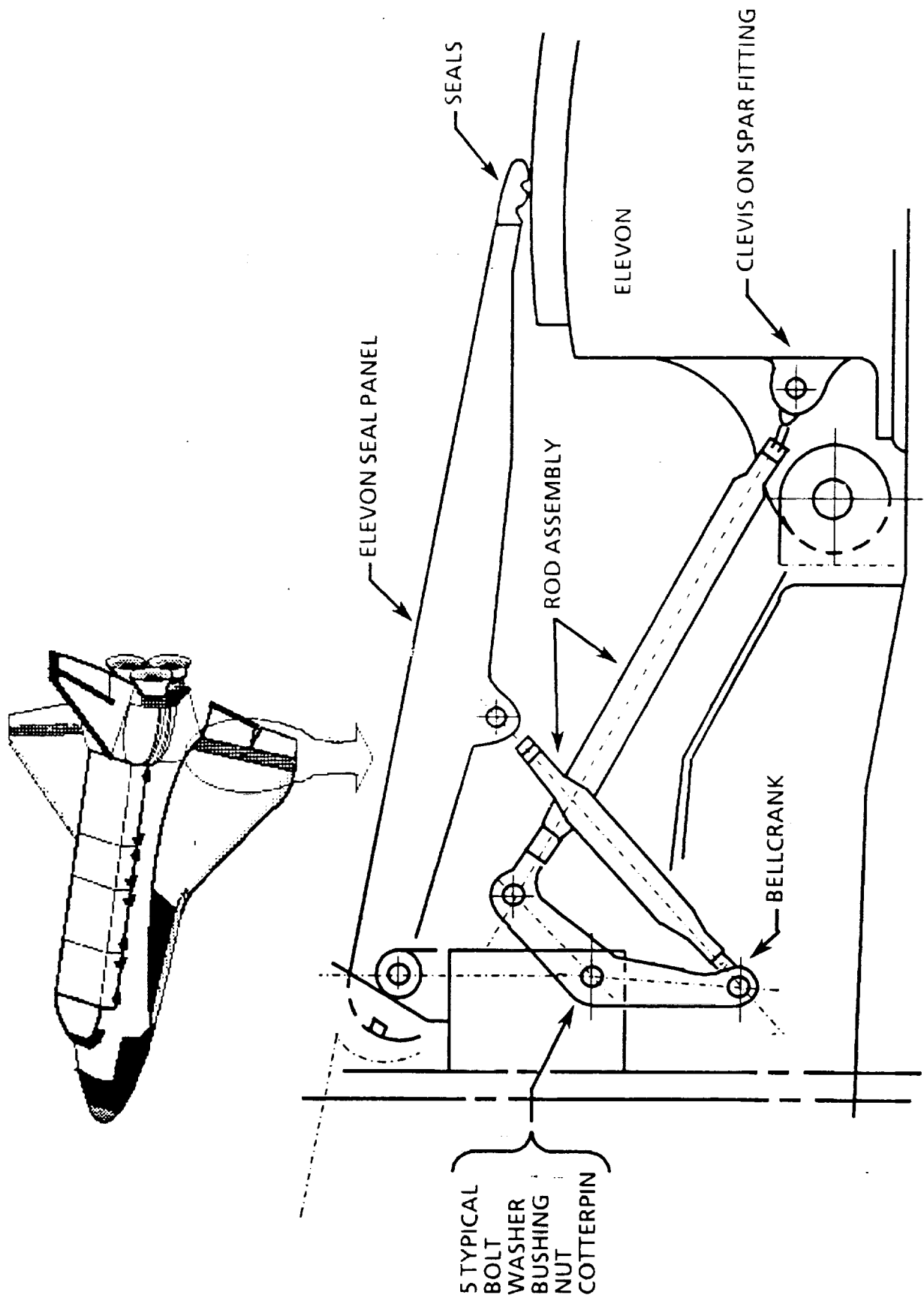


Figure 6 - ELEVON SEAL PANEL LINKAGE OVERVIEW

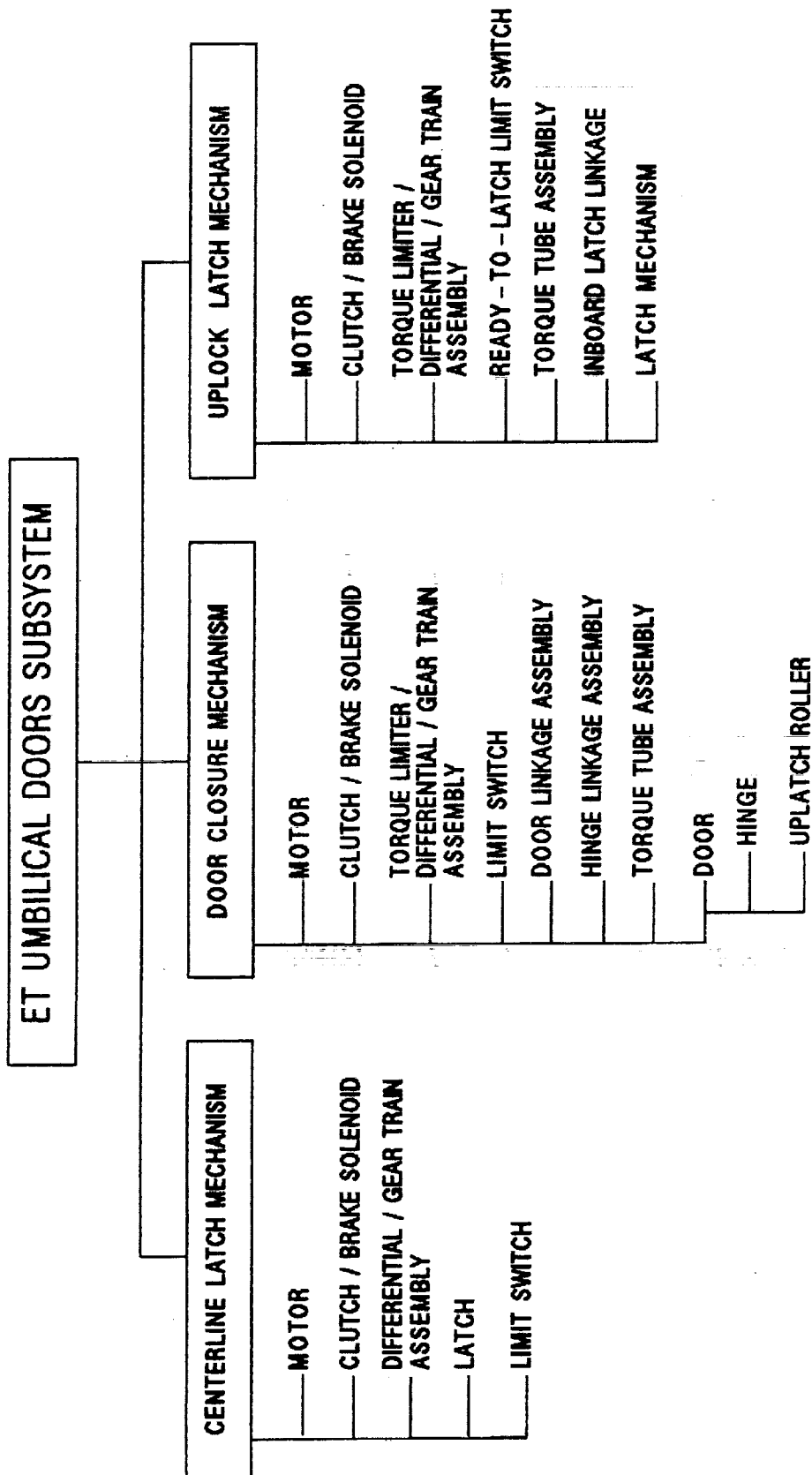


Figure 7 - ET UMBILICAL DOOR MECHANISM

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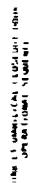


Figure 8 - ET UMBILICAL DOOR MECHANISM OVERVIEW

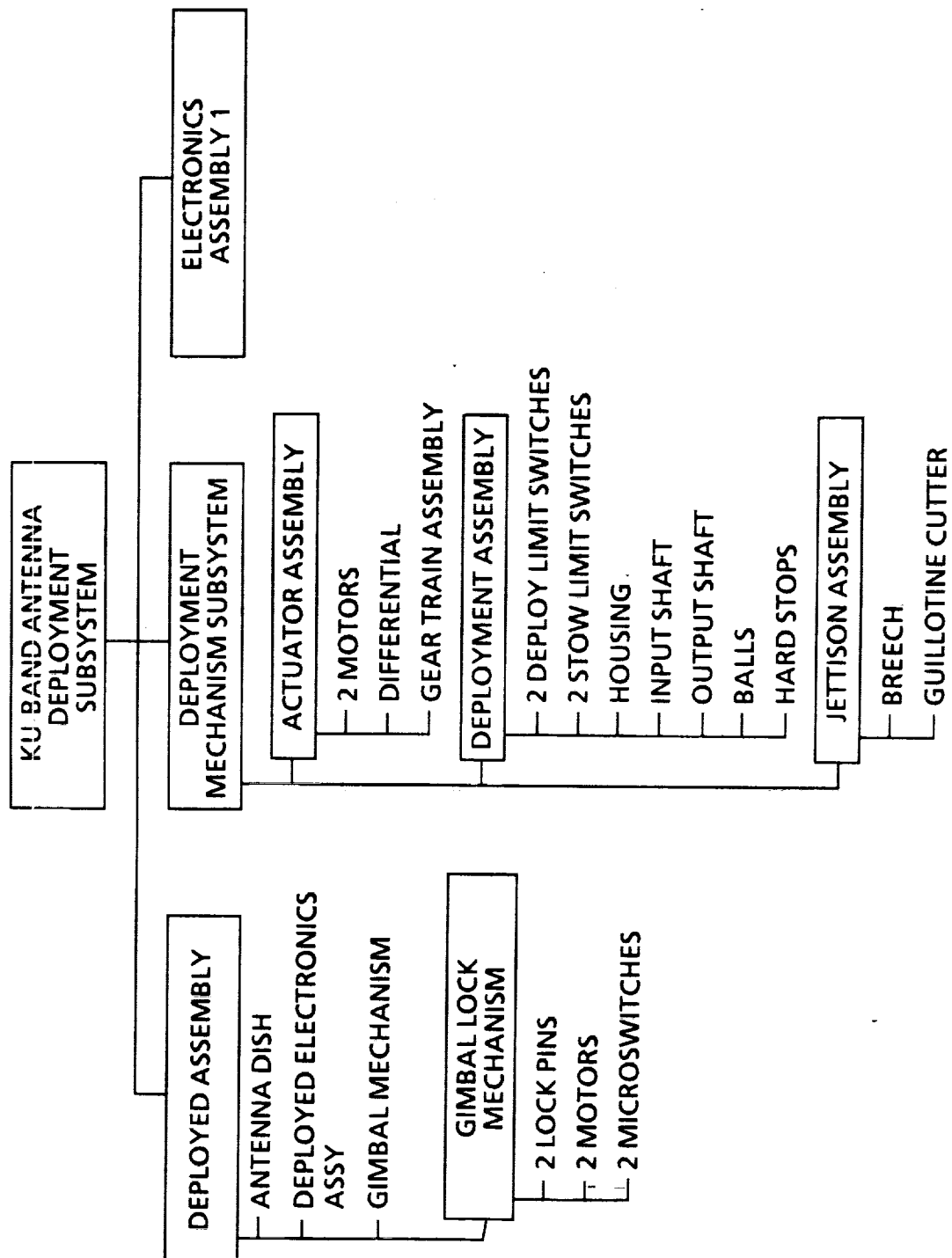


Figure 9 - Ku-BAND ANTENNA DEPLOYMENT SUBSYSTEM

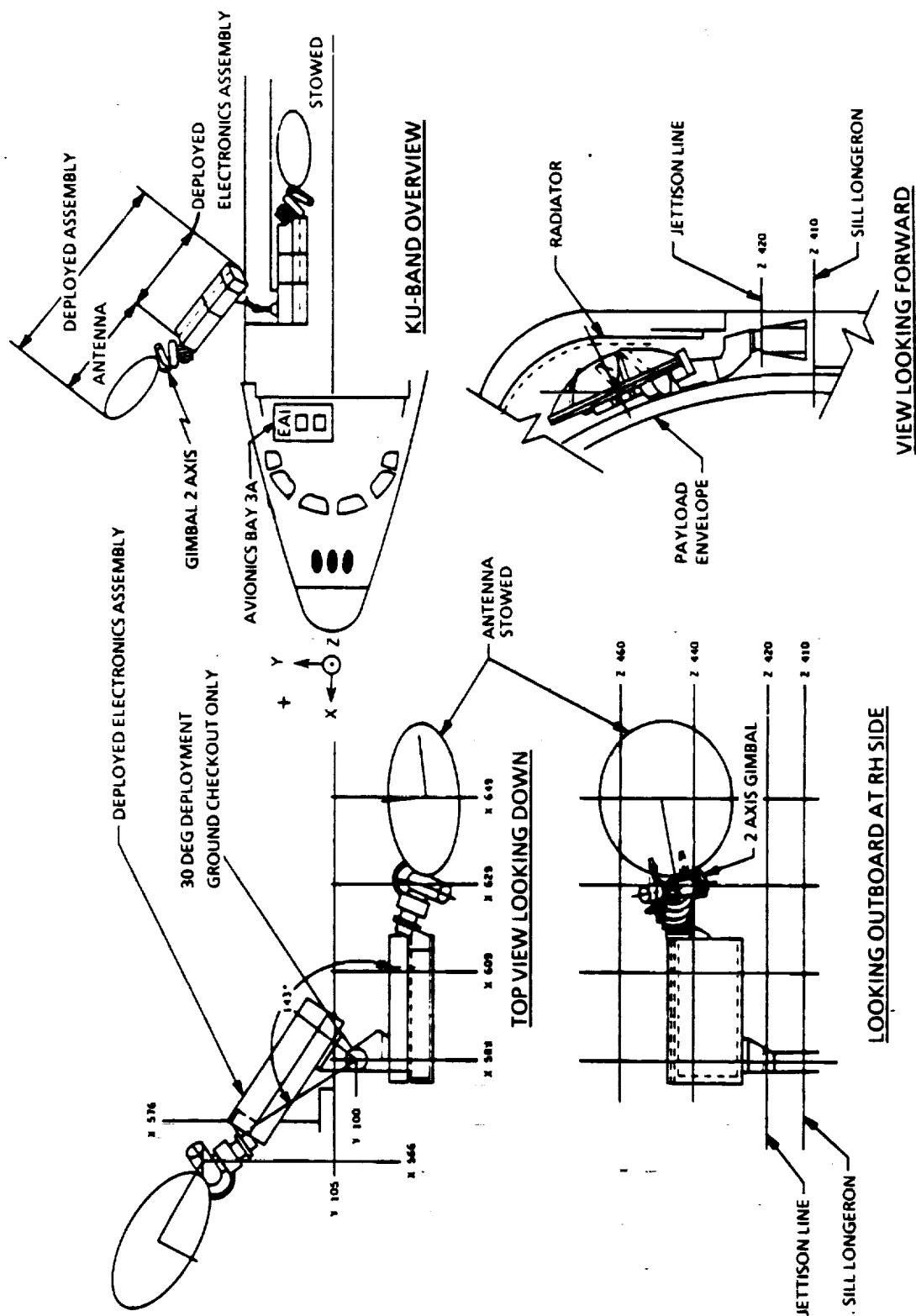


Figure 10 - Ku-BAND ANTENNA DEPLOYMENT OVERVIEW

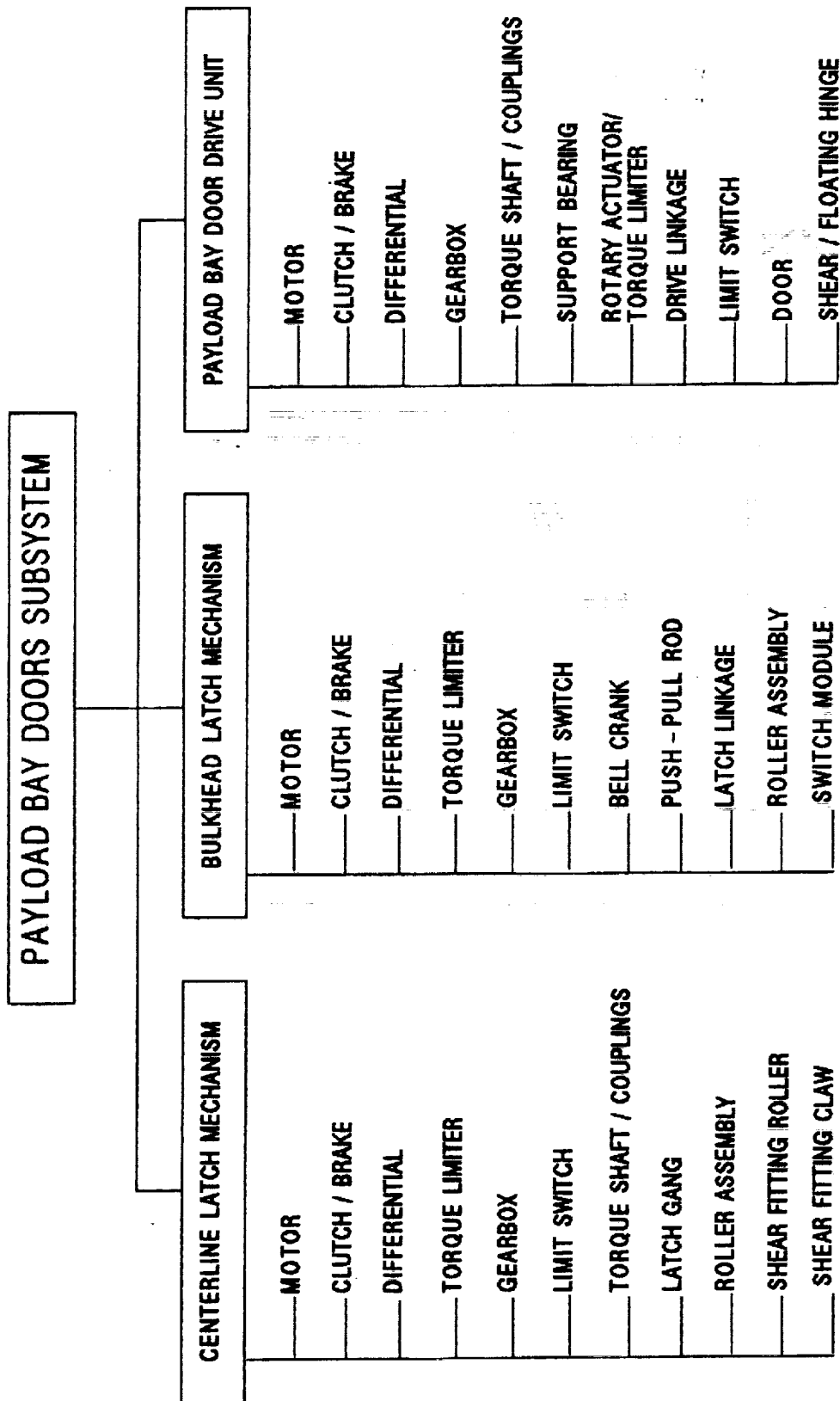
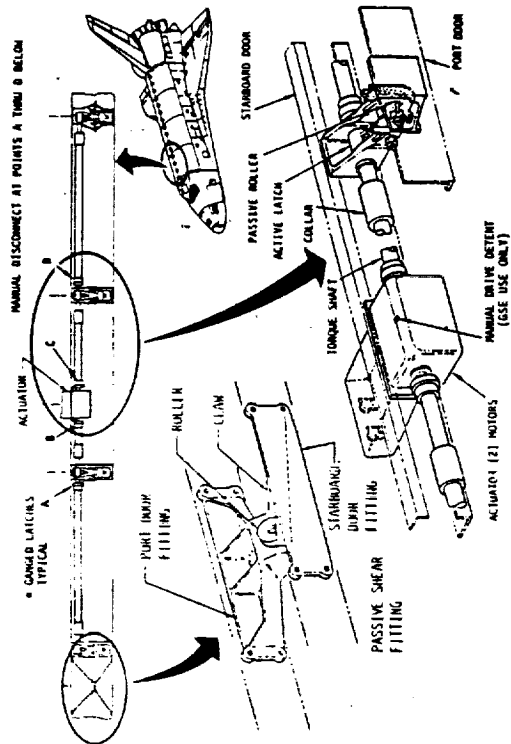
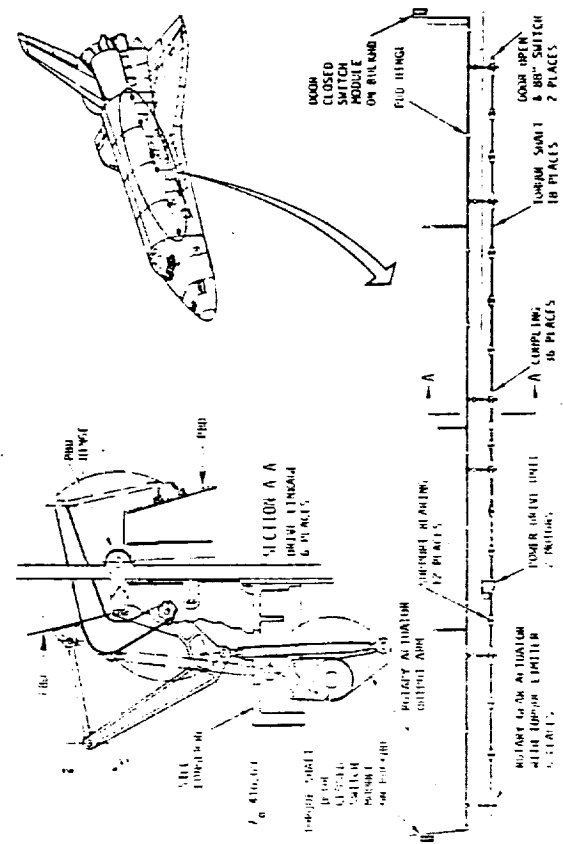


Figure 11 - PAYLOAD BAY DOOR MECHANISM

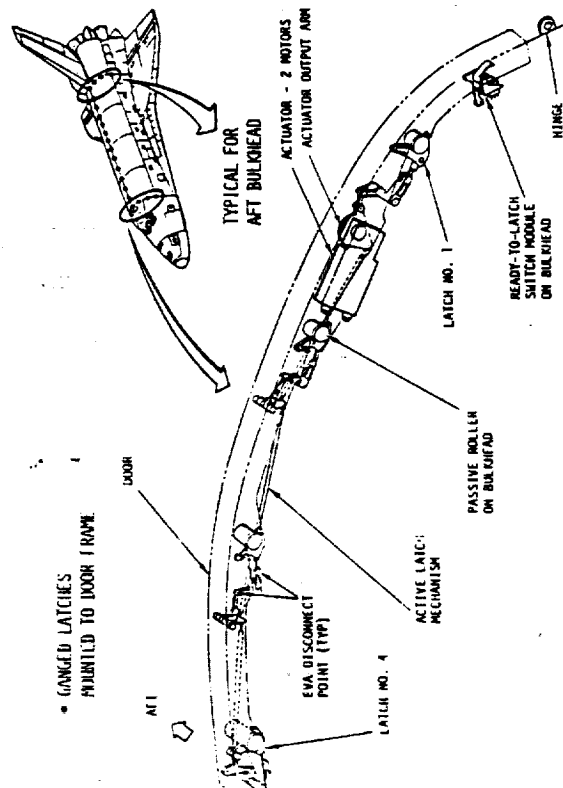
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Payload bay door centerline latch system.



Payload bay door drive system.



Bulkhead circular latch system (typical).

Figure 12 - PAYLOAD BAY DOOR MECHANISM OVERVIEW

# MECHANICAL ACTUATION SYSTEMS

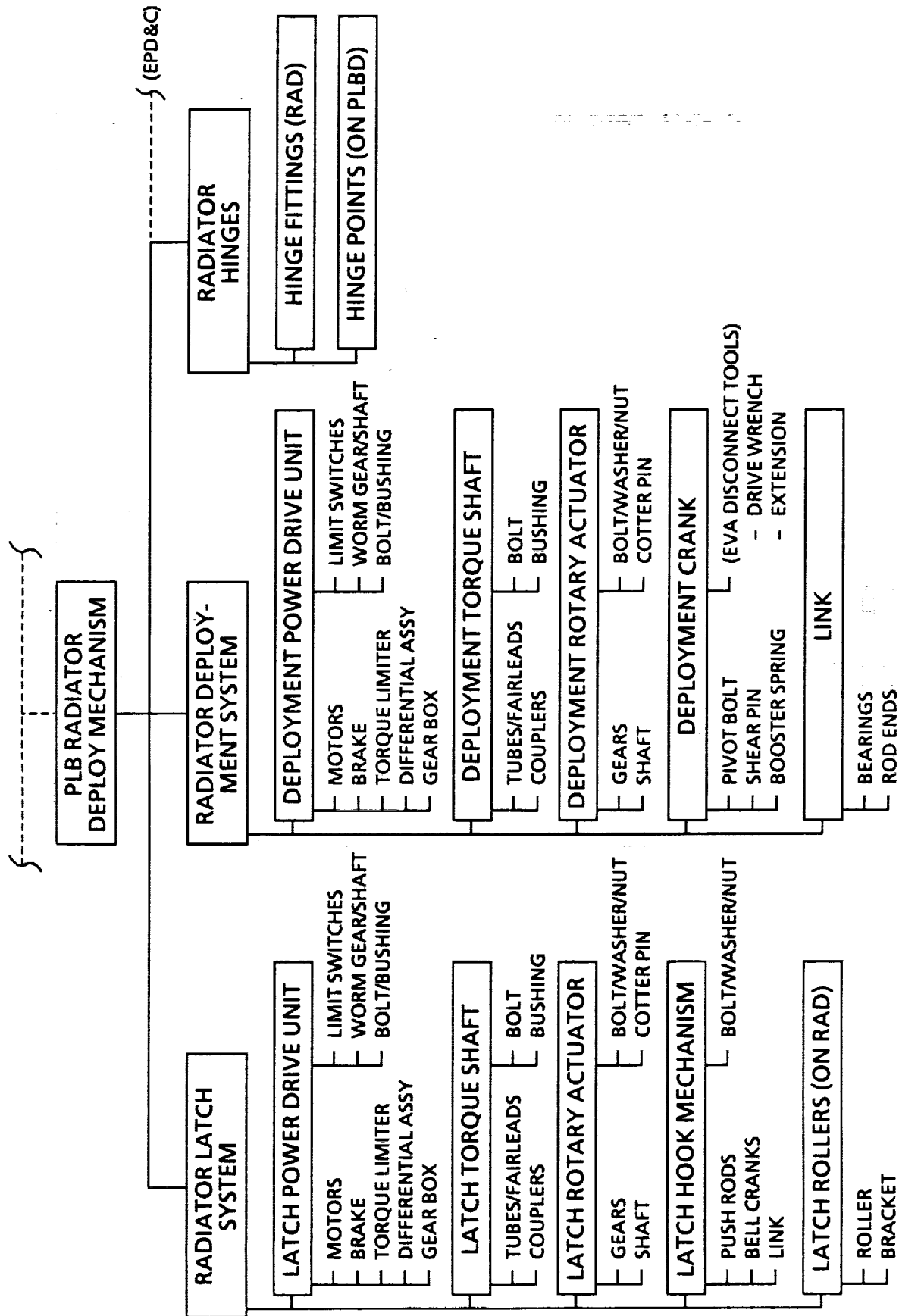


Figure 13 - PAYLOAD BAY RADIATOR DEPLOY SUBSYSTEM



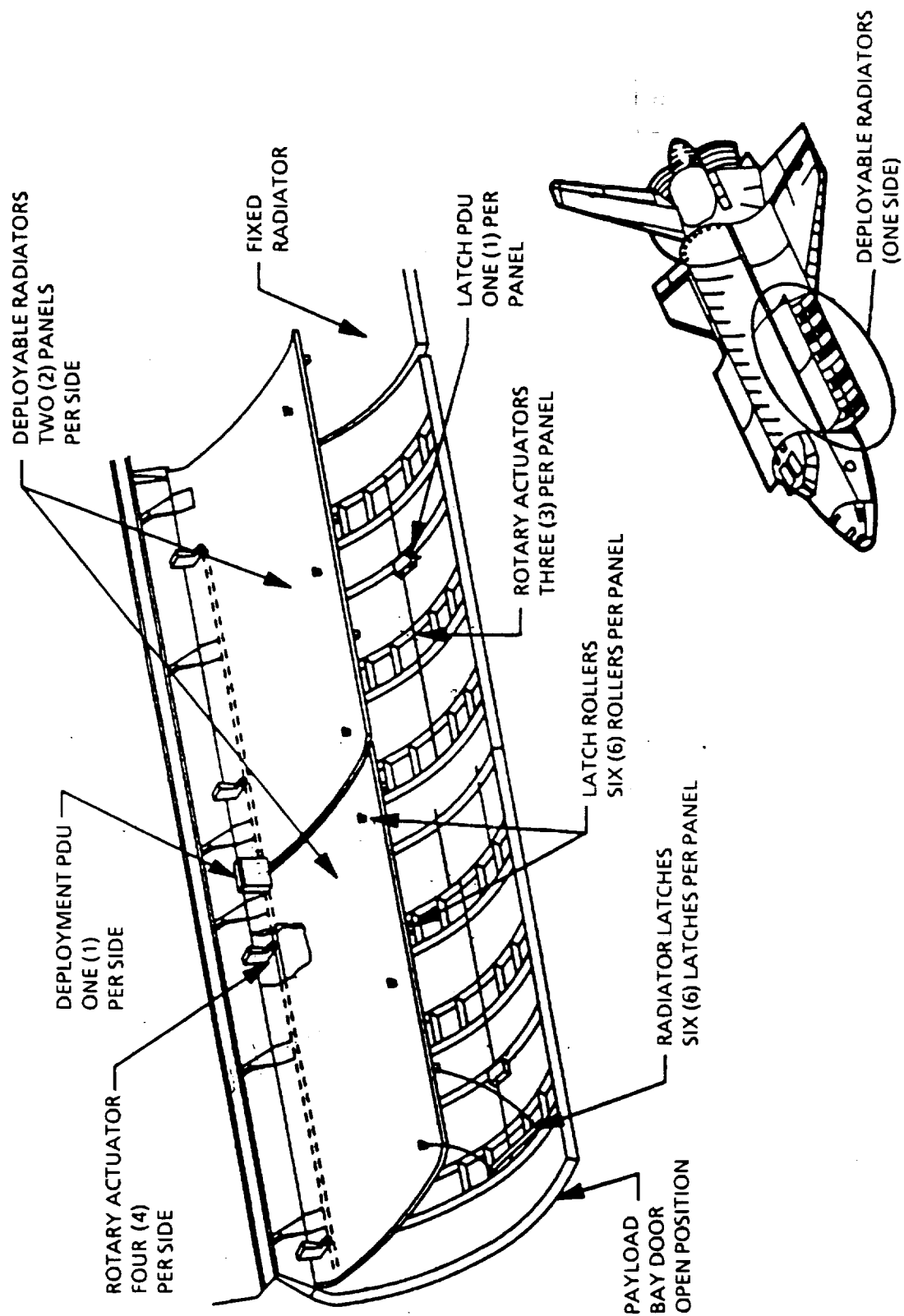


Figure 14 - RADIATOR DEPLOY SYSTEM

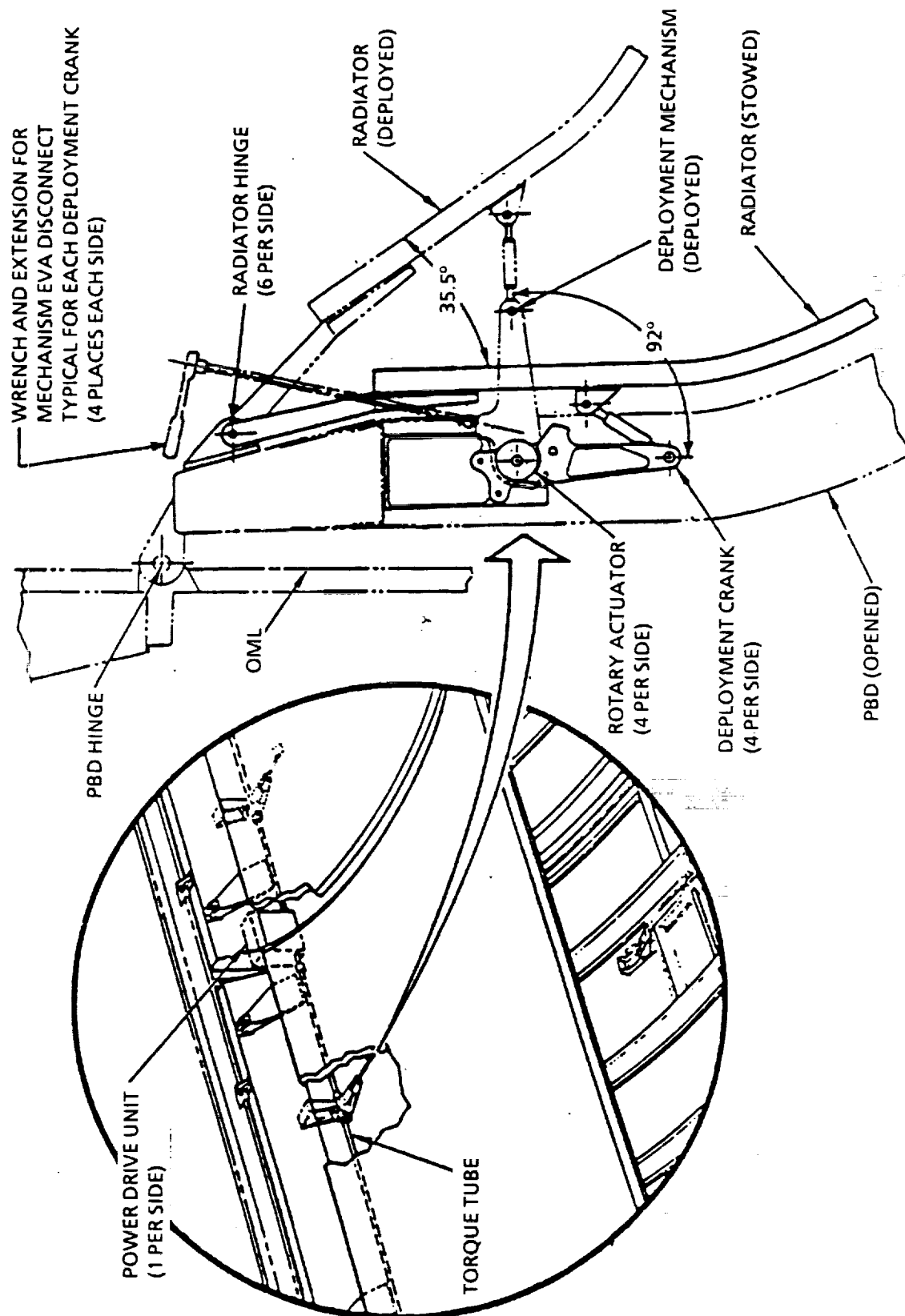


Figure 15 - RADIATOR DEPLOYMENT MECHANISM

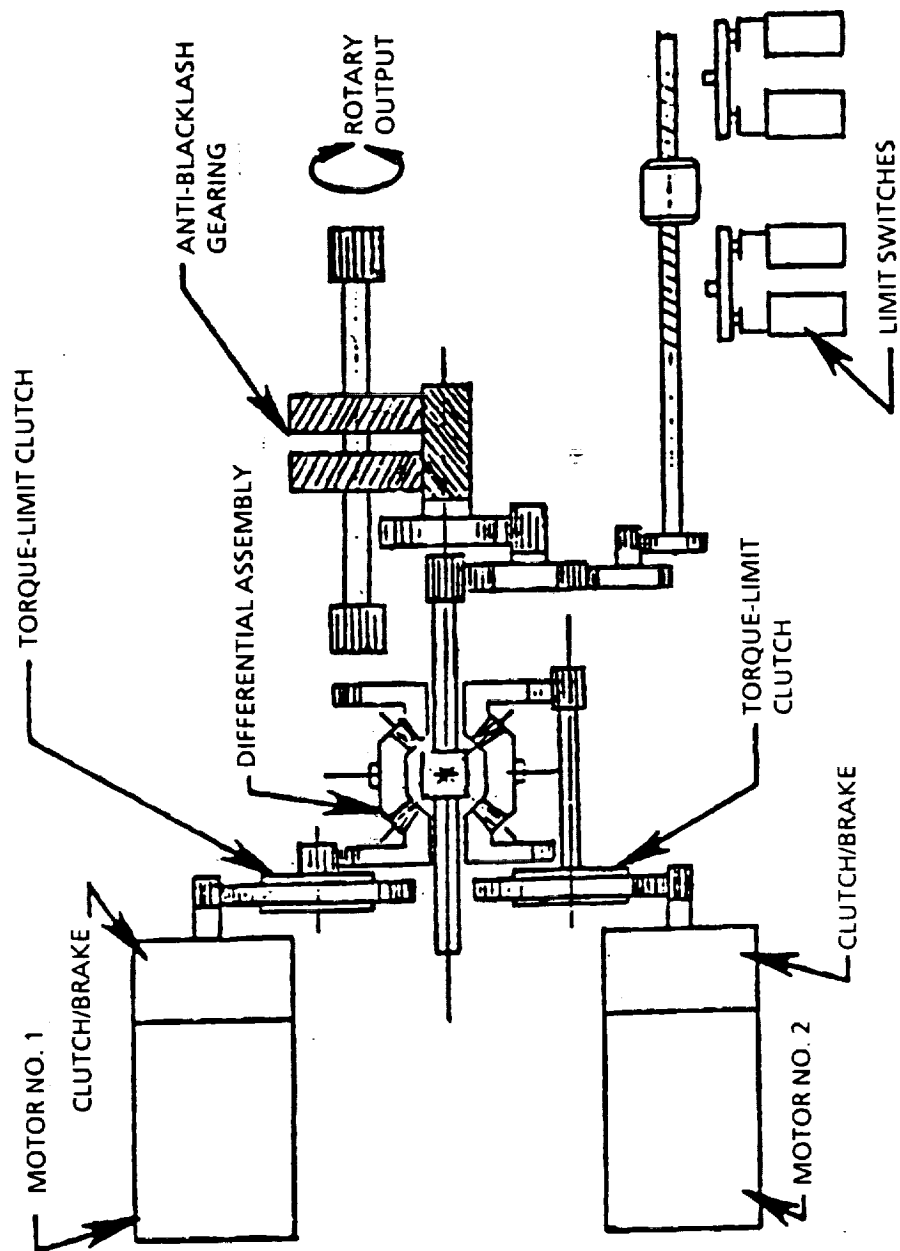


Figure 16 - POWER DRIVE UNIT (TYPICAL)

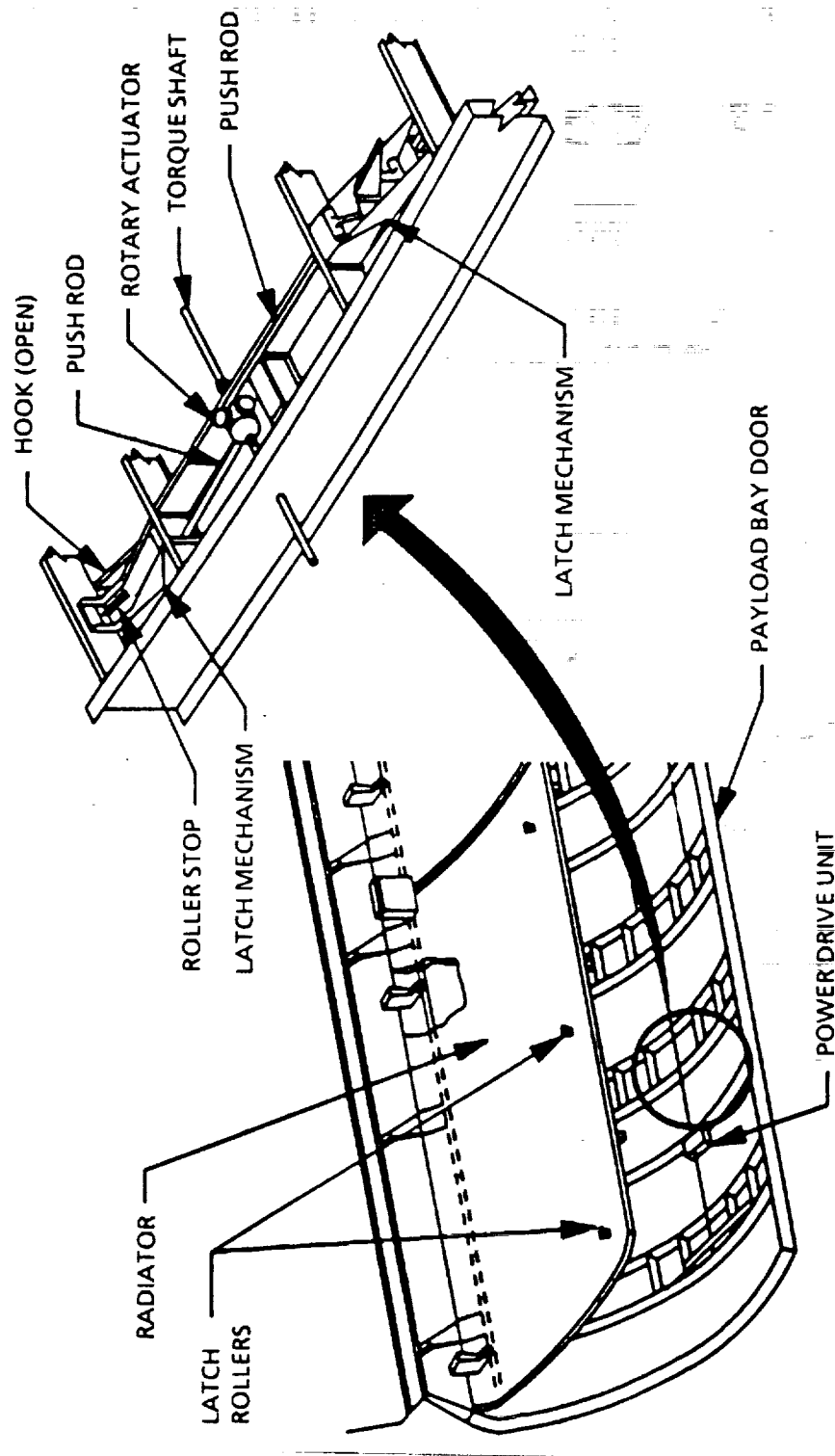


Figure 17 - RADIATOR LATCH SYSTEM

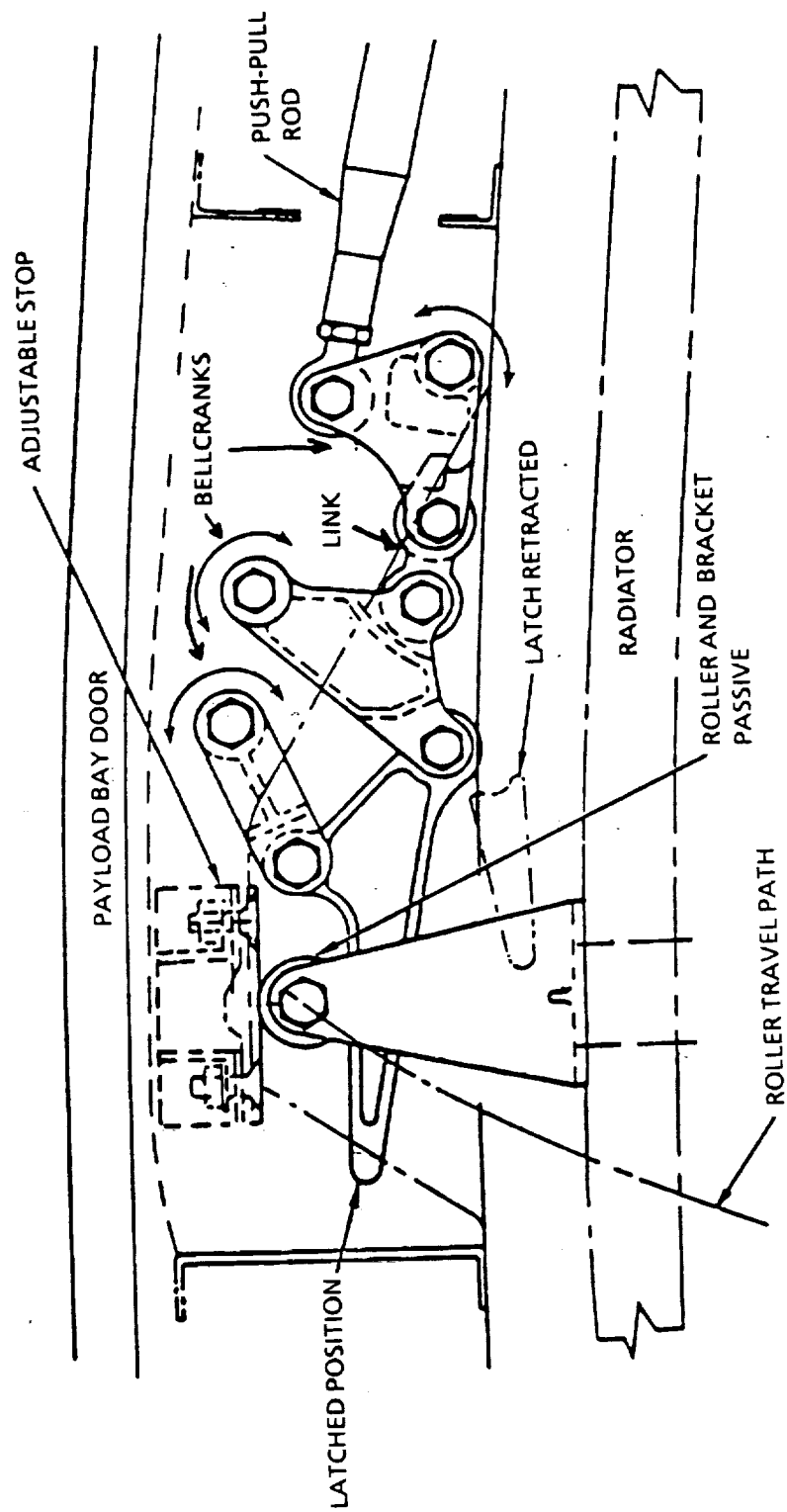


Figure 18 - RADIATOR LATCH HOOK MECHANISM

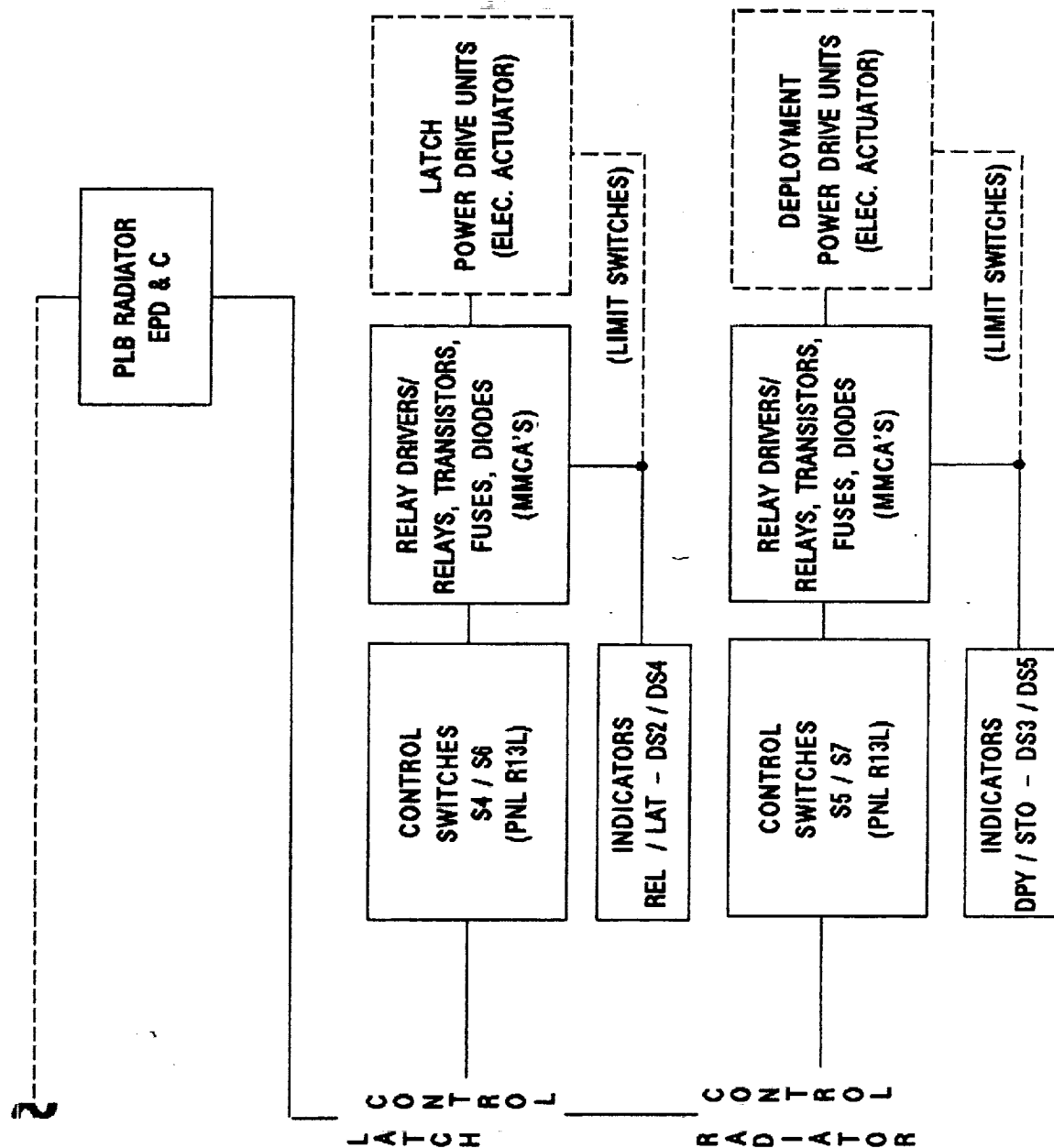
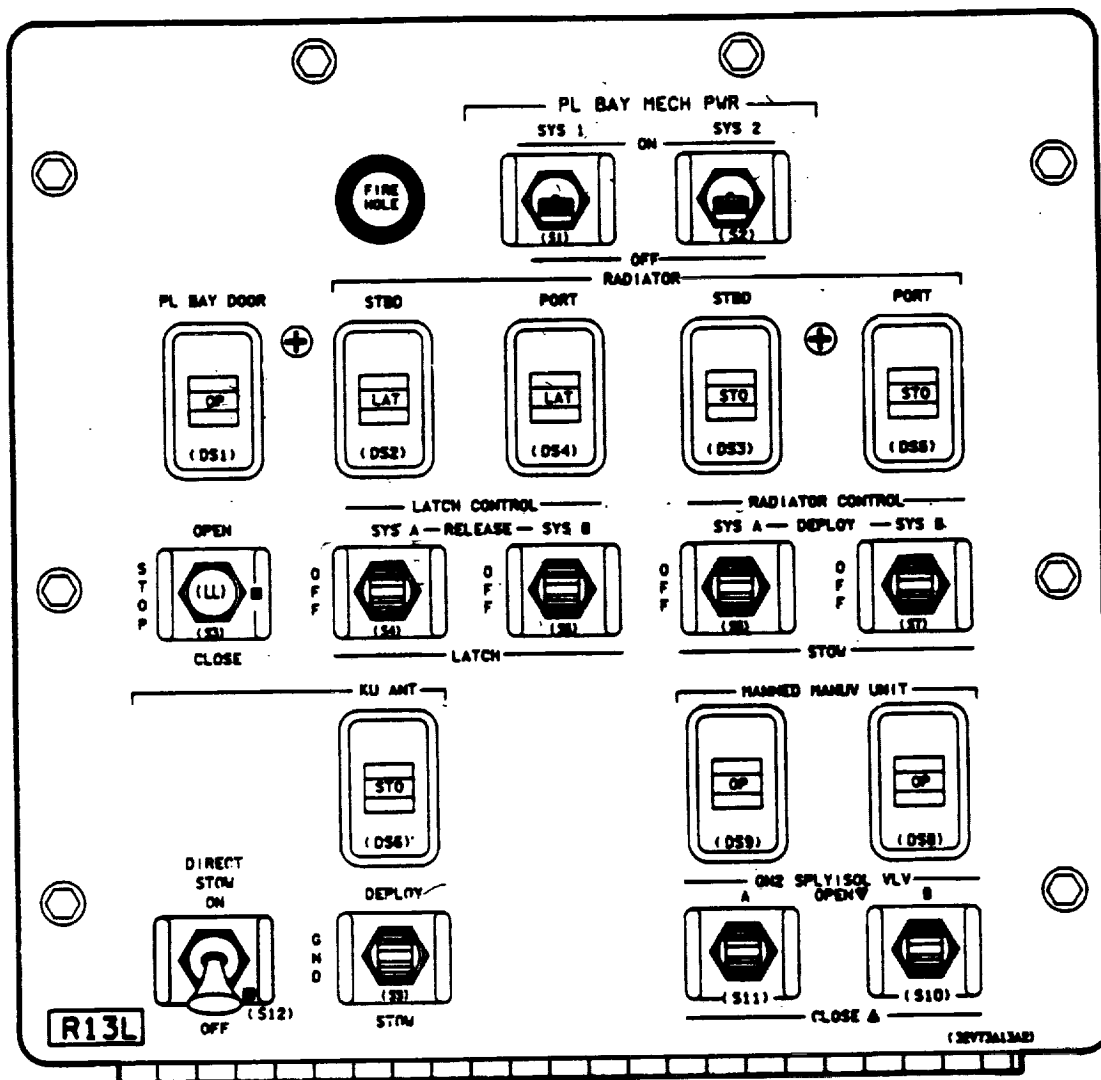


Figure 19 - PLB RADIATOR EPD&C



ORIGINAL PAGE IS  
OF POOR QUALITY

Figure 20 - PLB RADIATOR PANEL

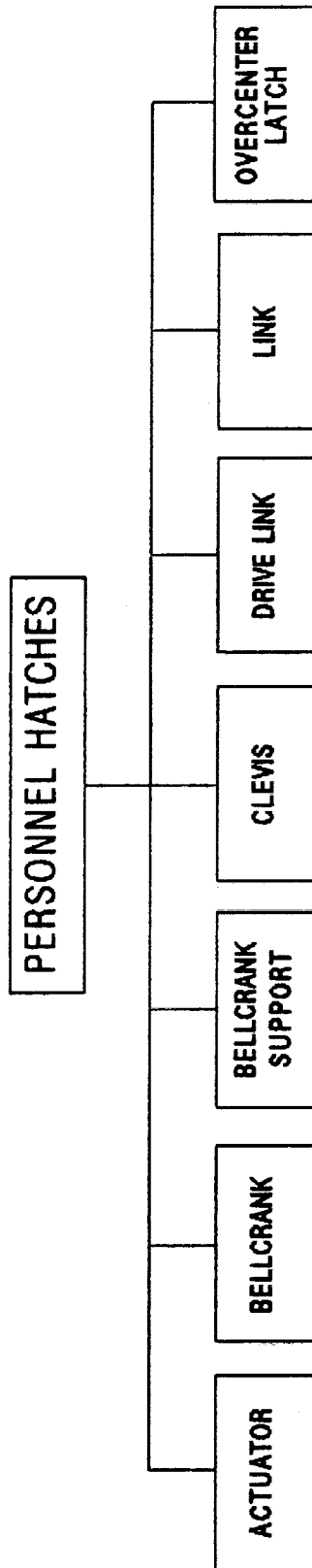


Figure 21 - PERSONNEL HATCH FUNCTIONAL DIAGRAM



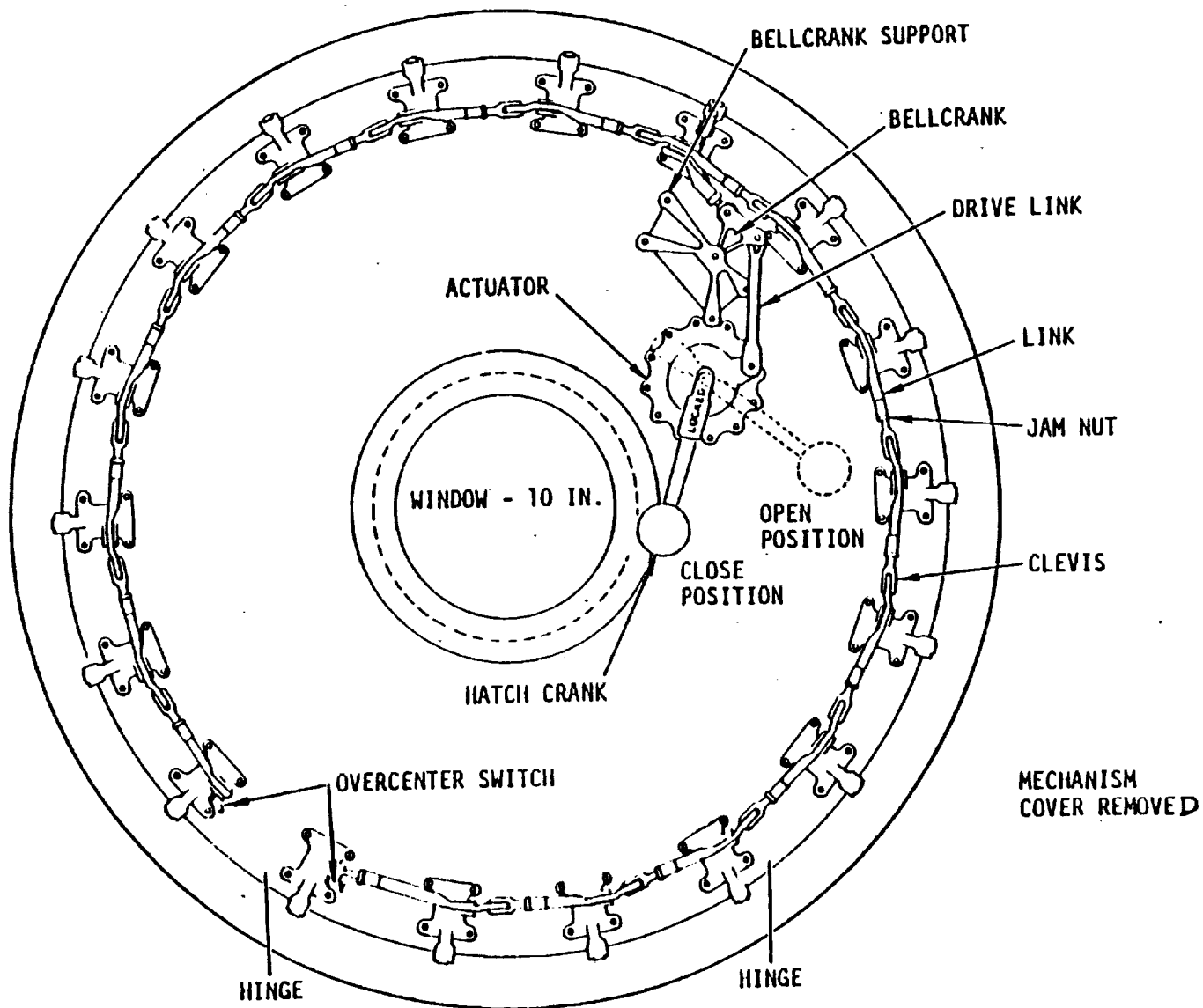


Figure 22 - INGRESS/EGRESS HATCH

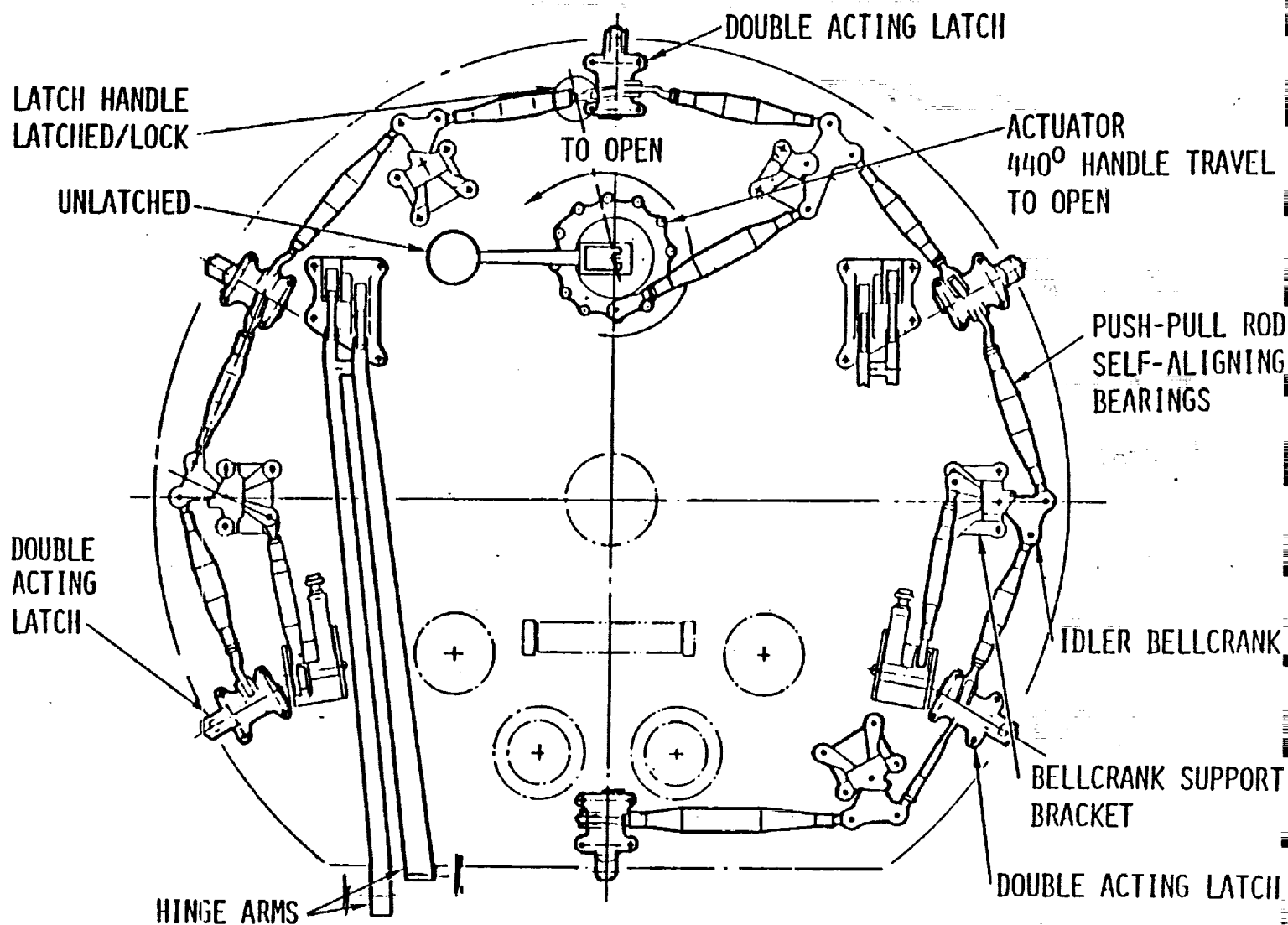


Figure 23 - AIRLOCK HATCH

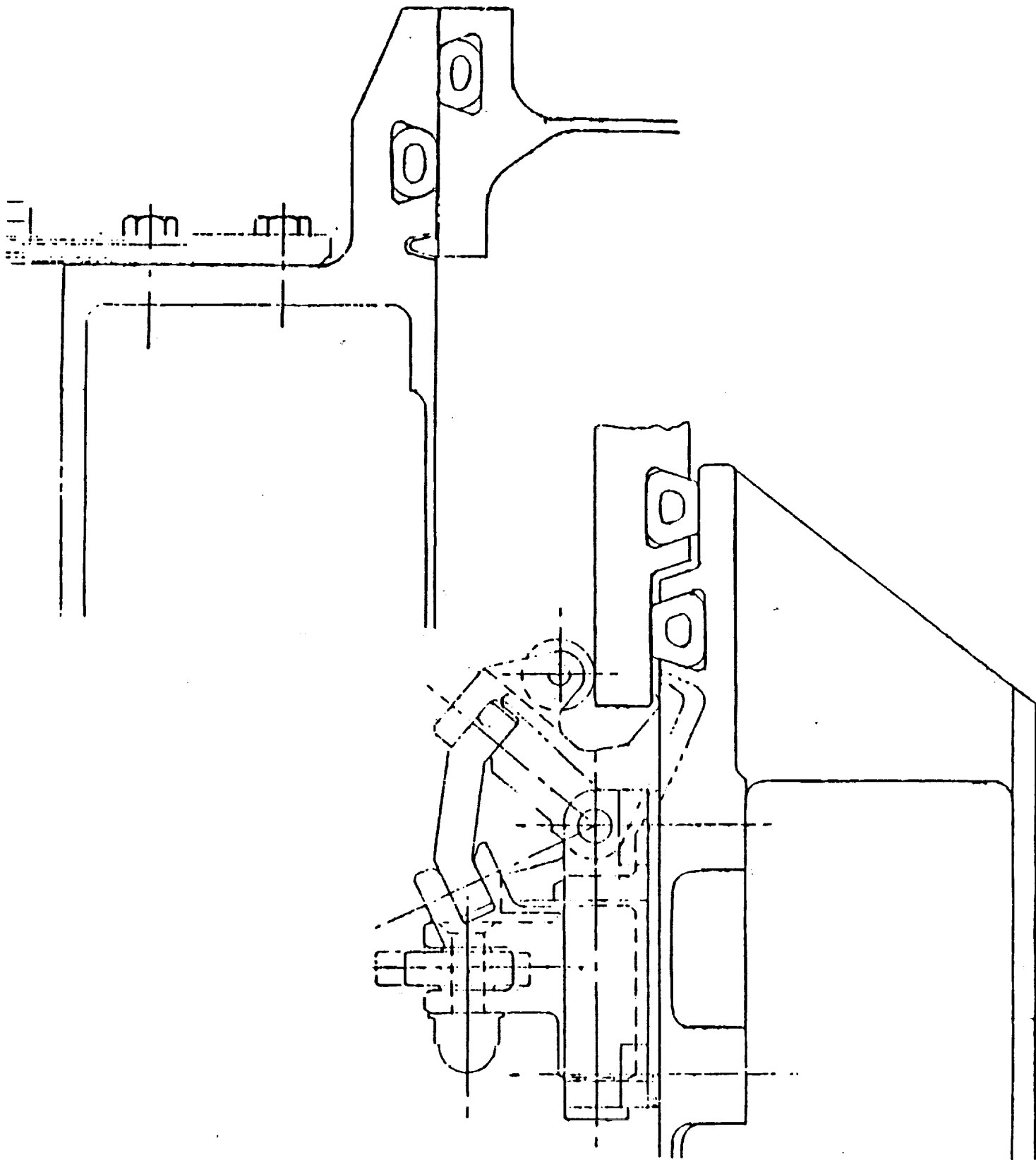


Figure 24 - HATCH SEALS

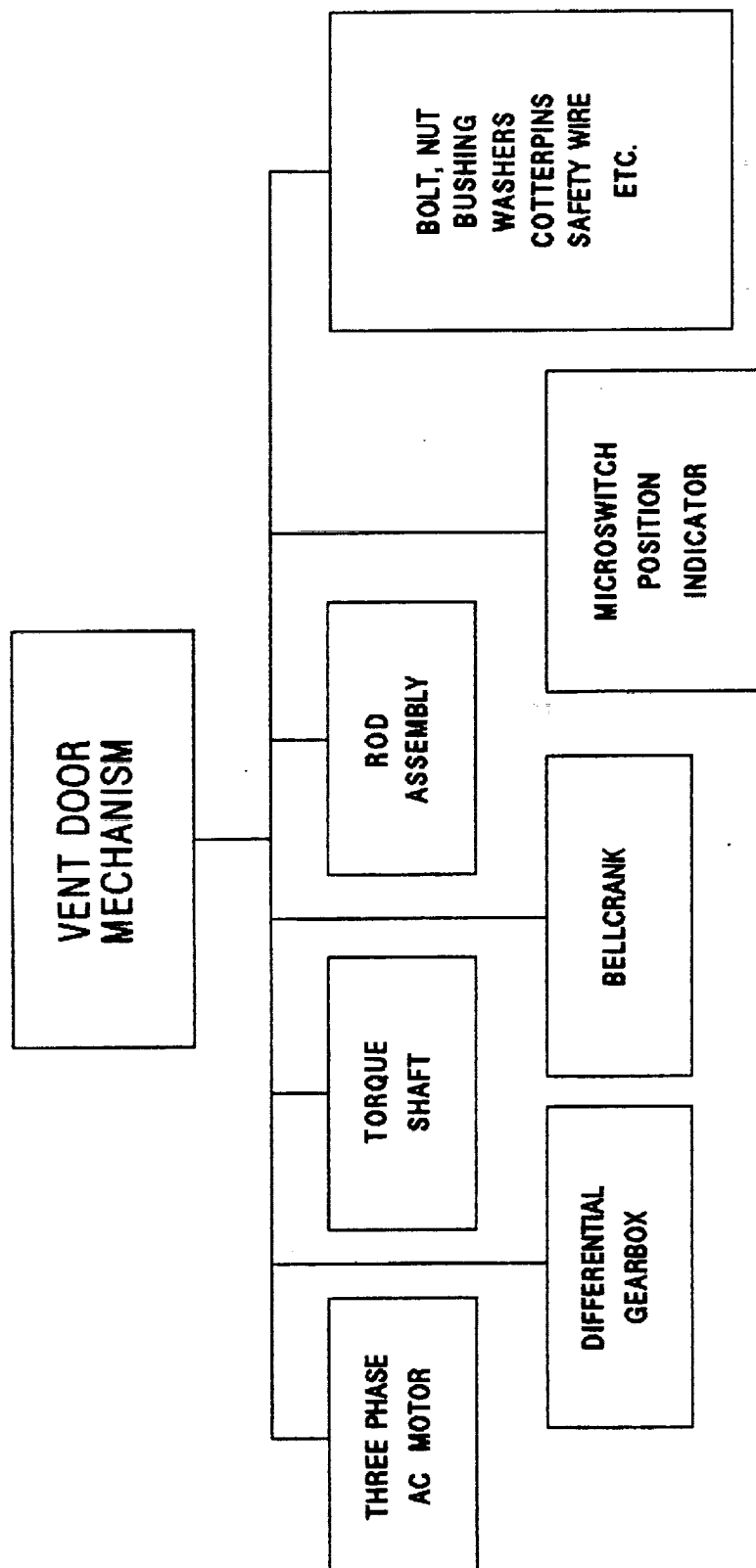
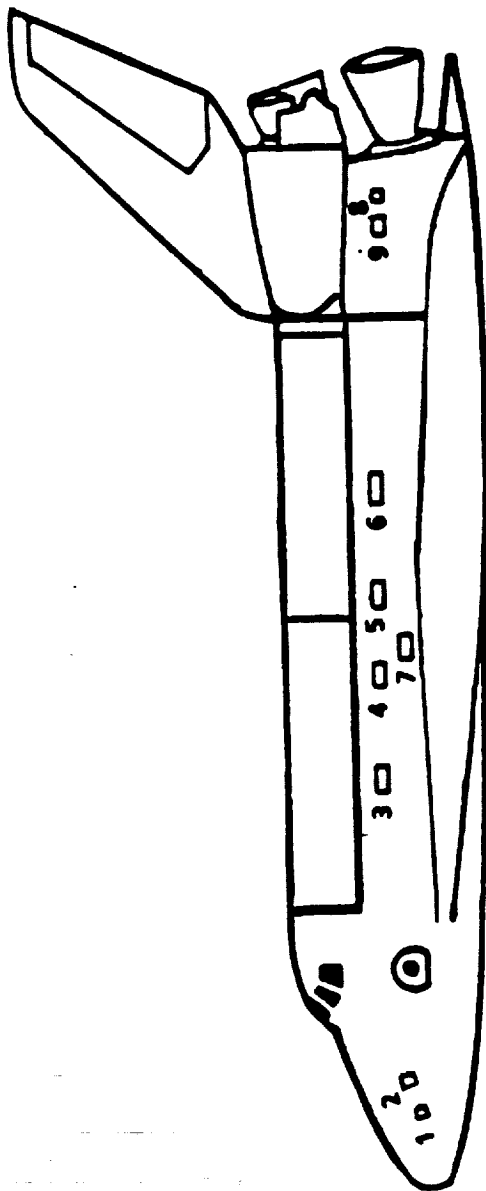


Figure 25 - VENT DOOR MECHANISM

# ORBITER VENT DOOR MECHANISM LOCATION

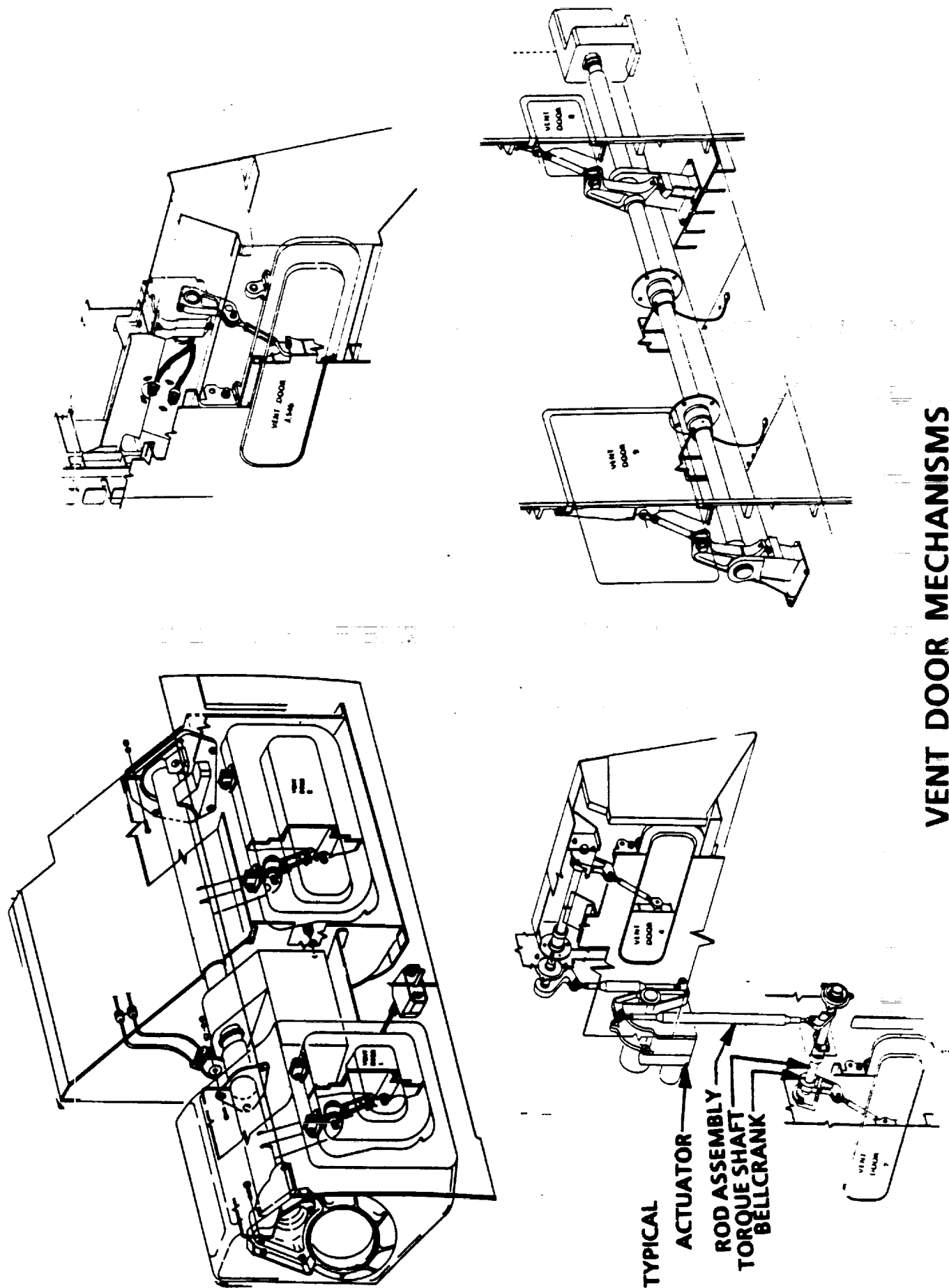


ALL VENTS SHOWN ARE PORT AND STARBOARD

- VENTS 1 AND 2 SHARE ACTUATOR
- VENTS 4 AND 7 SHARE ACTUATOR
- VENTS 8 AND 9 SHARE ACTUATOR
- VENTS 3, 5, & 6 HAVE UNIQUE ACTUATOR
- VENTS TOTAL 18

VENT NO.	COMPARTMENT VENTED	C/L VENT LOCATIONS		
		X <sub>0</sub>	± Y <sub>0</sub>	Z <sub>0</sub>
1	FWD RCS	383.05	75.27	371.01
2	FWD FUSELAGE PLENUM	399.13	79.24	374.58
3	MID FUSELAGE (CARGO BAY AND LOWER MID-FUSELAGE	765.12	105	385.43
4		904.70	105	385.43
5		995.50	105	385.43
6	WING	1127.84	105	385.43
7	OMS POD (DEDICATED)	934.12	105	356.19
8	AFT FUSELAGE	1429.29	116.49	335.50
9		1389.63	112.70	357.82

Figure 26 - VENT DOOR MECHANISM LOCATION



# VENT DOOR MECHANISMS

Figure 27 - VENT DOOR MECHANISM OVERVIEW

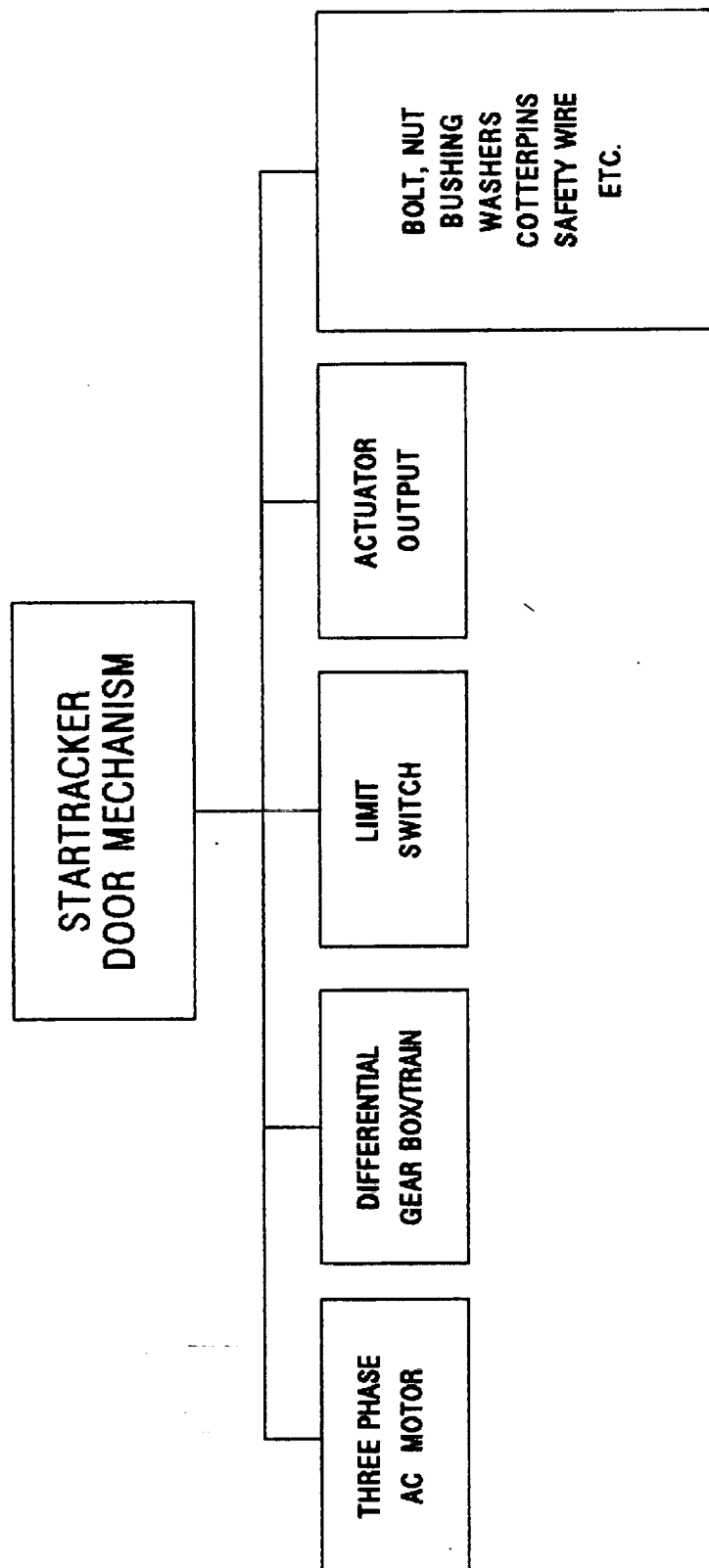
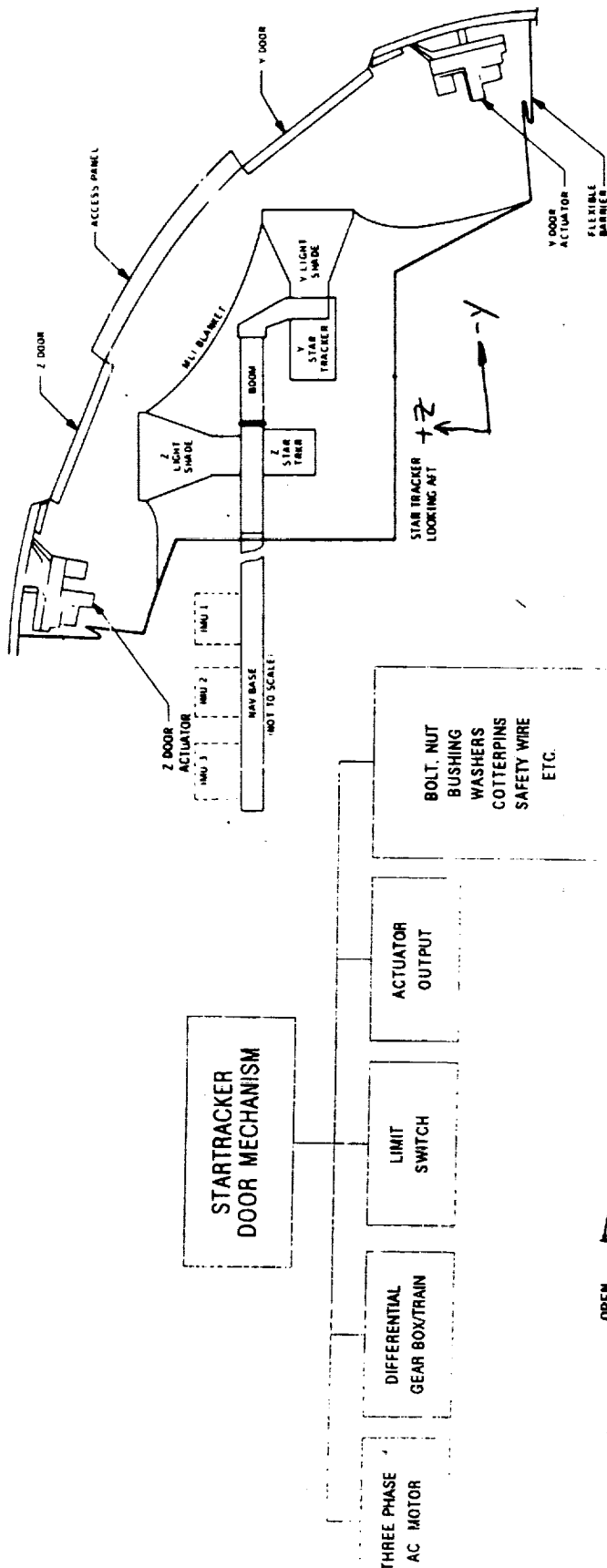
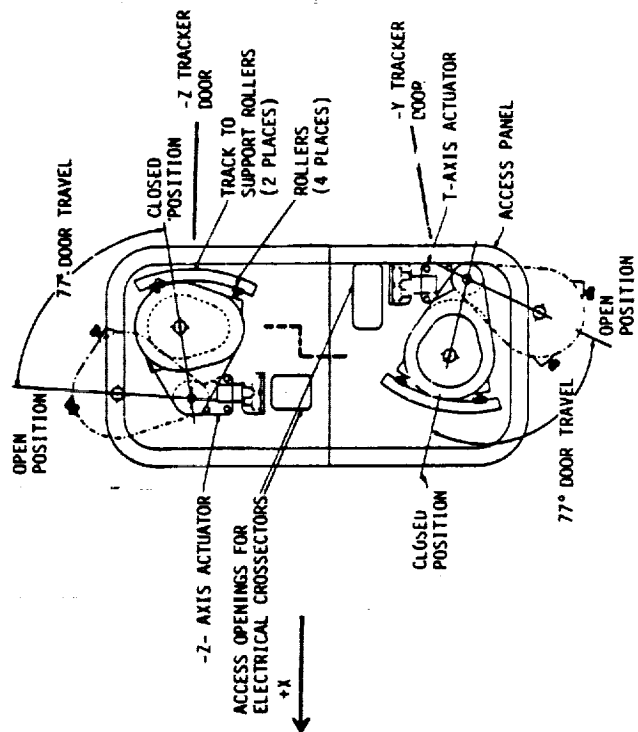


Figure 28 - STARTRACKER DOOR MECHANISM



Internal View of Tracker Subsystem (looking aft)



Star Tracker Door Locations

Tracker Door Travel Directions (viewed from outside)

Figure 29 - STARTRACKER DOOR MECHANISM OVERVIEW



#### 4.0 ANALYSIS RESULTS

Detailed analysis results for each of the identified failure modes are presented in Appendix C. Table I presents a summary of the failure criticalities for each of the nine major subdivisions of the MAS. Further discussion of each of these subdivisions and the applicable failure modes is provided in subsequent paragraphs.

Summary of IOA Failure Modes By Criticality (HW/F)							
Criticality :	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
ADP :	0	0	0	143	0	69	212
ESP :	6	0	0	0	0	1	7
ETU :	23	30	0	0	0	20	73
KBD :	3	6	1	111	42	37	200
PBD :	25	45	2	4	2	20	98
PLR :	0	0	0	14	0	22	36
PH :	1	0	0	12	3	5	21
VDM :	0	26	0	0	0	1	27
SDM :	0	0	0	6	0	5	11
TOTAL :	58	107	3	290	47	180	685

Of the 685 failure modes analyzed, 58 failures were determined to result in loss of crew or vehicle, and 110 were determined to result in loss of mission. A summary of the Potential Critical Items is presented in Table II. Appendix D presents a cross-reference between each Potential Critical Item (PCI) and a specific worksheet in Appendix C.

Summary of IOA Potential Critical Items (HW/F)						
Criticality :	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
ADP :	0	0	0	143	0	143
ESP :	6	0	0	0	0	6
ETU :	23	30	0	0	0	53
KBD :	3	6	1	110	42	162
PBD :	25	45	2	0	0	72
PLR :	0	0	0	0	0	0
PH :	1	0	0	10	3	14
VDM :	0	26	0	0	0	26
SDM :	0	0	0	0	0	0
TOTAL :	58	107	3	263	45	476

The scheme for assigning IOA analysis (Appendix C) worksheet numbers is shown in Table III.

TABLE III IOA Worksheet Numbers		
Component	IOA ID Number MECH	EPD&C
ADP	MAS-1101 to MAS-1112	MAS-1500 to MAS-1699
ESP	MAS-2100 to MAS-2106	NA
ETU	MAS-3101 to MAS-3144	MAS-3501 to MAS-3529
KBD	MAS-4101 to MAS-4113	MAS-4500 to MAS-4687
PBD	MAS-5101 to MAS-5179	MAS-5501 to MAS-5519
PBR	MAS-6101 to MAS-6302	MAS-6501 to MAS-6510
PH	MAS-7100 to MAS-7120	NA
VDM	MAS-8100 to MAS-8109	MAS-8501 to MAS-8517
SDM	MAS-9100 to MAS-9108	MAS-9500 to MAS-9501

#### 4.1 Analysis Results - Air Data Probe

The ADP analysis examined the components required to deploy the Orbiter Air Data Probes. The analysis identified 11 failure modes and 212 worksheets were generated. The analysis results identified 143 PCIs and these are listed in Appendix D.

#### 4.2 Analysis Results - Elevon Seal Panel

The ESP analysis examined the components of the 34 outboard and inboard ESP linkage mechanisms. The analysis identified 7 failure modes and 7 worksheets were generated. The analysis results identified 6 PCIs and these are listed in Appendix D.

#### 4.3 Analysis Results - External Tank Umbilical

The ETU analysis examined the components required to protect the Orbiter ET Umbilical Cavities from entry heating. The analysis identified 23 failure modes and 73 worksheets were generated. The analysis results identified 53 PCIs and these are listed in Appendix D.

#### 4.4 Analysis Results - Ku Band Deploy

The KBD analysis examined the components required to deploy/stow the Ku-Band Antenna. The analysis identified potential failure modes and 200 worksheets were generated. The analysis results identified 162 PCIs and these are listed in Appendix D.

#### 4.5 Analysis Results - Payload Bay Doors

The PBD analysis examined the components used to open and close the Payload Bay Doors. The analysis identified 27 failure modes and 98 worksheets were generated. The analysis results identified 72 PCIs and these are listed in Appendix D.

#### 4.6 Analysis Results - Payload Bay Radiators

The PBR analysis examined the components involved in latching and releasing, and deploying and stowing the Payload Bay Radiators. The analysis identified 18 failure modes and 36 worksheets were generated. The analysis results identified no PCIs.

#### 4.7 Analysis Results - Personnel Hatches

The PH analysis examined the possible failures in the components used to open and close the personnel hatches. The analysis identified 8 failure modes and 21 worksheets were generated. There were 14 PCIs identified and these are listed in Appendix D.

#### 4.8 Analysis Results - Vent Door Mechanism

The VDM analysis examined the components involved in opening/closing the Active Vent Doors and providing purge control via these vent ports. The analysis identified 10 potential failure modes and 27 worksheets were generated. The analysis results identified 26 PCIs and these are listed in Appendix D.

#### 4.9 Analysis Results - Startracker Door

The SDM analysis examined the components required to open/close the Startracker Doors. The analysis identified potential failure modes and 11 worksheets were generated. The analysis results identified no PCIs.

## 5.0 REFERENCES

Reference documentation available from NASA and Rockwell was used in the analysis. The documentation used includes the following:

1. JSC-18341 Mechanical Systems Console Handbook, Volume I, 3-1-85 & Volume II, 2-28-85.
2. JSC-18863 Shuttle Operations, Guidance Navigation & Control, 9-30-85.
3. JSC-08934 Shuttle Operational Data Book Rev. D, 10-1-84.
4. VS70-971102 Integrated System Schematic Rev. D, 9-28-85.
5. JSC-12770 Shuttle Flight Operations Manual, Volume 2, Electrical Power Systems, 11-28-84.
6. JSC-12820 STS Operational Flight Rules, Final PCN-1, 4-16-87.
7. JSC-11174 Space Shuttle System Handbook, Rev. C, DCN-5, 9-13-85.
8. V72 Vol III Operations and Maintenance Requirements and Specification Document - Orbiter OMRSD.
9. VS70-973099 Integrated System Schematic, Rev. A10, 10-17-85.
10. SD72-SH-0102-12 Requirements/Definition Document Rendezvous Radar Deployment Mechanisms Volume 2-12, 11-1-75.
11. VS72-956099 Integrated System Schematic, Mechanical & Payload Systems, 2-11-85.
12. NSTS 22206 Instructions for Preparation of Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL), change 2, PRCBD 40107D, 3-28-87.
13. STRK/COAS 2102 Star Tracker/Crew Optical Alignment Sight Workbook, 9-30-83.
14. VS70-590509 Schematic Diagram - Active Vent Door Subsystem, Rev-C, 1-17-85.

**APPENDIX A**  
**ACRONYMS**

AC - Alternating Current  
ADP - Air Data Probe  
AOA - Abort Once Around  
ATCS - Active Thermal Control System  
ATO - Abort To Orbit  
BLKHD - Bulkhead  
CI - Critical Item  
CIL - Critical Items List  
CL - Center Line  
CRIT - Criticality  
DPS - Data Processing System  
ESP - Elevon Seal Panel  
ET - External Tank  
ETU - External Tank Umbilical  
ETUD - ETU Door  
EVA - Extravehicular Activity  
F - Functional  
FM - Failure Mode  
FMEA - Failure Mode and Effects Analysis  
GFE - Government Furnished Equipment  
GN&C - Guidance, Navigation and Control  
HW - Hardware  
IOA - Independent Orbiter Assessment  
KBD - Ku-Band Deploy  
LRU - Line Replaceable Unit  
MAS - Mechanical Actuation System  
MDAC - McDonnell Douglas Astronautics Company  
MTR - Motor  
NA - Not Applicable  
NASA - National Aeronautics and Space Administration  
NSTS - National Space Transportation System  
OMRSD - Operational Maintenance Requirements and Specifications Document  
OMS - Orbital Maneuvering System  
PCI - Potential Critical Item  
PDU - Power Drive Unit  
PH - Personnel Hatches  
PLB - Payload Bay  
PBD - Payload Bay Doors  
PBR - Payload Bay Radiator  
RI - Rockwell International  
RM - Redundancy Management  
RPC - Remote Power Controller  
RS - Redundant Set  
RTLS - Return To Landing Site

SDM - Startracker Door Mechanism  
SM - Systems Management  
STS - Space Transportation System  
SW - Switch  
TAL - Transatlantic Abort Landing  
TD - Touch Down  
THC - Translational Hand Controller  
TLC - Torque Limit Clutch  
VDC - Volts Direct Current  
VDM - Vent Door Mechanism

## **APPENDIX B**

### **DEFINITIONS, GROUND RULES, AND ASSUMPTIONS**

- B.1 Definitions**
- B.2 Project Level Ground Rules and Assumptions**
- B.3 Subsystem-Specific Ground Rules and Assumptions**

**APPENDIX B**  
**DEFINITIONS, GROUND RULES, AND ASSUMPTIONS**

**B.1 Definitions**

Definitions contained in NSTS 22206, Instructions For Preparation of FMEA/CIL, 10 October 1986, were used with the following amplifications and additions.

**INTACT ABORT DEFINITIONS:**

RTLS - begins at transition to OPS 6 and ends at transition to OPS 9, post-flight

TAL - begins at declaration of the abort and ends at transition to OPS 9, post-flight

AOA - begins at declaration of the abort and ends at transition to OPS 9, post-flight

ATO - begins at declaration of the abort and ends at transition to OPS 9, post-flight

CREDIBLE (CAUSE) - an event that can be predicted or expected in anticipated operational environmental conditions. Excludes an event where multiple failures must first occur to result in environmental extremes

CONTINGENCY CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

EARLY MISSION TERMINATION - termination of on-orbit phase prior to planned end of mission

EFFECTS/RATIONALE - description of the case which generated the highest criticality

HIGHEST CRITICALITY - the highest functional criticality determined in the phase-by-phase analysis

MAJOR MODE (MM) - major sub-mode of software operational sequence (OPS)

MC - Memory Configuration of Primary Avionics Software System (PASS)

MISSION - assigned performance of a specific Orbiter flight with payload/objective accomplishments including orbit phasing and altitude (excludes secondary payloads such as GAS cans, middeck P/L, etc.)



MULTIPLE ORDER FAILURE - describes the failure due to a single cause or event of all units which perform a necessary (critical) function

OFF-NOMINAL CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

OPS - software operational sequence

PRIMARY MISSION OBJECTIVES - worst case primary mission objectives are equal to mission objectives

PHASE DEFINITIONS:

PRELAUNCH PHASE - begins at launch count-down Orbiter power-up and ends at moding to OPS Major Mode 102 (liftoff)

LIFTOFF MISSION PHASE - begins at SRB ignition (MM 102) and ends at transition out of OPS 1 (Synonymous with ASCENT)

ONORBIT PHASE - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8

DEORBIT PHASE - begins at transition to OPS Major Mode 301 and ends at first main landing gear touchdown

LANDING/SAFING PHASE - begins at first main gear touchdown and ends with the completion of post-landing safing operations

**APPENDIX B**  
**DEFINITIONS, GROUND RULES, AND ASSUMPTIONS**

**B.2 IOA Project Level Ground Rules and Assumptions**

The philosophy embodied in NSTS 22206, Instructions for Preparation of FMEA/CIL, 10 October 1986, was employed with the following amplifications and additions.

1. The operational flight software is an accurate implementation of the Flight System Software Requirements (FSSRs).

RATIONALE: Software verification is out-of-scope of this task.

2. After liftoff, any parameter which is monitored by system management (SM) or which drives any part of the Caution and Warning System (C&W) will support passage of Redundancy Screen B for its corresponding hardware item.

RATIONALE: Analysis of on-board parameter availability and/or the actual monitoring by the crew is beyond the scope of this task.

3. Any data employed with flight software is assumed to be functional for the specific vehicle and specific mission being flown.

RATIONALE: Mission data verification is out-of-scope of this task.

4. All hardware (including firmware) is manufactured and assembled to the design specifications/drawings.

RATIONALE: Acceptance and verification testing is designed to detect and identify problems before the item is approved for use.

5. All Flight Data File crew procedures will be assumed performed as written, and will not include human error in their performance.

RATIONALE: Failures caused by human operational error are out-of-scope of this task.

6. All hardware analyses will, as a minimum, be performed at the level of analysis existent within NASA/Prime Contractor Orbiter FMEA/CILs, and will be permitted to go to greater hardware detail levels but not lesser.

RATIONALE: Comparison of IOA analysis results with other analyses requires that both analyses be performed to a comparable level of detail.

7. Verification that a telemetry parameter is actually monitored during AOS by ground-based personnel is not required.

RATIONALE: Analysis of mission-dependent telemetry availability and/or the actual monitoring of applicable data by ground-based personnel is beyond the scope of this task.

8. The determination of criticalities per phase is based on the worst case effect of a failure for the phase being analyzed. The failure can occur in the phase being analyzed or in any previous phase, whichever produces the worst case effects for the phase of interest.

RATIONALE: Assigning phase criticalities ensures a thorough and complete analysis.

9. Analysis of wire harnesses, cables, and electrical connectors to determine if FMEAs are warranted will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

10. Analysis of welds or brazed joints that cannot be inspected will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

11. Emergency system or hardware will include burst discs and will exclude the EMU Secondary Oxygen Pack (SOP), pressure relief valves and the landing gear pyrotechnics.

RATIONALE: Clarify definition of emergency systems to ensure consistency throughout IOA project.

## **APPENDIX B**

### **DEFINITIONS, GROUND RULES, AND ASSUMPTIONS**

#### **B.3 MAS-Specific Ground Rules and Assumptions**

The IOA analysis was performed to the component or assembly level of the Orbiter Mechanical Actuation System. The analysis considered the worst case effects of the hardware or functional failure on the subsystem, mission, and crew and vehicle safety.

**APPENDIX C  
DETAILED ANALYSIS**

This section contains the IOA analysis worksheets employed during the analysis of the Mechanical Actuation System. The information on these worksheets is intentionally similar to the FMEA's written by Rockwell and the NASA. Each of these sheets identifies the item being analyzed, and parent assembly, as well as the function. For each failure mode, the possible causes are outlined, and the assessed hardware and functional criticality for each mission phase is listed, as described in the Rockwell Desk Instructions 100-2G. Finally, effects are entered at the bottom of each sheet, and the worst case criticality is entered at the top.

**LEGEND FOR IOA ANALYSIS WORKSHEETS**  
-----

**Hardware Criticalities :**

- 1 = Loss of life or vehicle
- 2 = Loss of mission
- 3 = Non loss of life or vehicle or mission

**Functional Criticalities :**

- 1R = Redundant identical hardware components or redundant functional paths all of which, if failed, could cause loss of life or vehicle.
- 2R = Redundant identical hardware components or redundant functional paths all of which, if failed, could cause loss of mission.

**Redundancy Screen A :**

- 1 = Is Checked Out PreFlight
- 2 = Is Capable of Check Out PreFlight
- 3 = Not Capable of Check Out PreFlight
- 4 = Do Not Know

**Redundancy Screens B and C :**

- P = Passed Screen
- F = Failed Screen
- NA = Not Applicable

C.1

## AIR DATA PROBE ANALYSIS WORKSHEETS

# AIR DATA PROBE ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
1101 *	3/1R	3/1R	P	F	P	MOTOR
1102 *	3/1R	3/1R	P	F	P	GEARBOX
1103 *	3/1R	3/1R	P	F	P	GEARBOX
1104 *	3/1R	3/1R	P	F	P	PRESSURE LINE
1105 *	3/1R	3/1R	P	F	P	PROBE
1106 *	3/1R	3/1R	P	F	P	PROBE
1107 *	3/1R	3/1R	P	F	P	SHAFT
1108 *	3/1R	3/1R	P	F	P	SHAFT
1109	3/3	3/3				DEPLOY MICROSWITCH
1110	3/3	3/3				DEPLOY MICROSWITCH
1111	3/3	3/3				STOW MICROSWITCH
1112	3/3	3/3				STOW MICROSWITCH
1500 *	3/1R	3/1R	P	F	P	+28V CONTACT #1
1501 *	3/1R	3/1R	P	F	P	+28V CONTACT #1
1502 *	3/1R	3/1R	P	F	P	+28V CONTACT #2
1503 *	3/1R	3/1R	P	F	P	+28V CONTACT #2
1504 *	3/1R	3/1R	P	F	P	+28V CONTACT #3
1505 *	3/1R	3/1R	P	F	P	+28V CONTACT #3
1506 *	3/1R	3/1R	P	F	P	+28V CONTACT #4
1507 *	3/1R	3/1R	P	F	P	+28V CONTACT #4
1508	3/3	3/3				+28V CONTACT #1
1509 *	3/1R	3/1R	P	F	P	+28V CONTACT #1
1510	3/3	3/3				+28V CONTACT #2
1511 *	3/1R	3/1R	P	F	P	+28V CONTACT #2
1512	3/3	3/3				+28V CONTACT #3
1513 *	3/1R	3/1R	P	F	P	+28V CONTACT #3
1514	3/3	3/3				+28V CONTACT #4
1515 *	3/1R	3/1R	P	F	P	+28V CONTACT #4
1516 *	3/1R	3/1R	P	F	P	+28V CONTACT #1
1517	3/3	3/3				+28V CONTACT #1
1518 *	3/1R	3/1R	P	F	P	+28V CONTACT #2
1519	3/3	3/3				+28V CONTACT #2
1520 *	3/1R	3/1R	P	F	P	+28V CONTACT #3
1521	3/3	3/3				+28V CONTACT #3
1522 *	3/1R	3/1R	P	F	P	+28V CONTACT #4
1523	3/3	3/3				+28V CONTACT #4
1524 *	3/1R	3/1R	P	F	P	+28V CONTACT #1
1525	3/3	3/3				+28V CONTACT #1
1526 *	3/1R	3/1R	P	F	P	+28V CONTACT #2
1527	3/3	3/3				+28V CONTACT #2
1528	3/3	3/3				CONTACT #1
1529	3/3	3/3				CONTACT #1
1530	3/3	3/3				CONTACT #2
1531	3/3	3/3				CONTACT #2
1532 *	3/1R	3/1R	P	F	P	+28V CONTACT #1

(\*) Potential Critical Items.

# AIR DATA PROBE ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
1533 *	3/1R	3/1R	P	F	P	+28V CONTACT #1
1534 *	3/1R	3/1R	P	F	P	+28V CONTACT #2
1535 *	3/1R	3/1R	P	F	P	+28V CONTACT #2
1536 *	3/1R	3/1R	P	F	P	+28V CONTACT #3
1537 *	3/1R	3/1R	P	F	P	+28V CONTACT #3
1538 *	3/1R	3/1R	P	F	P	+28V CONTACT #4
1539 *	3/1R	3/1R	P	F	P	+28V CONTACT #4
1540	3/3	3/3				+28V CONTACT #1
1541 *	3/1R	3/1R	P	F	P	+28V CONTACT #1
1542	3/3	3/3				+28V CONTACT #2
1543 *	3/1R	3/1R	P	F	P	+28V CONTACT #2
1544	3/3	3/3				+28V CONTACT #3
1545 *	3/1R	3/1R	P	F	P	+28V CONTACT #3
1546	3/3	3/3				+28V CONTACT #4
1547 *	3/1R	3/1R	P	F	P	+28V CONTACT #4
1548 *	3/1R	3/1R	P	F	P	+28V CONTACT #1
1549	3/3	3/3				+28V CONTACT #1
1550 *	3/1R	3/1R	P	F	P	+28V CONTACT #2
1551	3/3	3/3				+28V CONTACT #2
1552 *	3/1R	3/1R	P	F	P	+28V CONTACT #3
1553	3/3	3/3				+28V CONTACT #3
1554 *	3/1R	3/1R	P	F	P	+28V CONTACT #4
1555	3/3	3/3				+28V CONTACT #4
1556 *	3/1R	3/1R	P	F	P	+28V CONTACT #1
1557	3/3	3/3				+28V CONTACT #1
1558 *	3/1R	3/1R	P	F	P	+28V CONTACT #2
1559	3/3	3/3				+28V CONTACT #2
1560	3/3	3/3				CONTACT #1
1561	3/3	3/3				CONTACT #1
1562	3/3	3/3				CONTACT #2
1563	3/3	3/3				CONTACT #2
1564 *	3/1R	3/1R	P	F	P	INVERTED AND GATE
1565 *	3/1R	3/1R	P	F	P	INVERTED AND GATE
1566 *	3/1R	3/1R	P	F	P	INVERTED AND GATE
1567 *	3/1R	3/1R	P	F	P	INVERTED AND GATE
1568 *	3/1R	3/1R	P	F	P	INVERTED AND GATE
1569	3/3	3/3				INVERTED AND GATE
1570 *	3/1R	3/1R	P	F	P	INVERTED AND GATE
1571	3/3	3/3				INVERTED AND GATE
1572 *	3/1R	3/1R	P	F	P	RELAY DRIVER
1573 *	3/1R	3/1R	P	F	P	RELAY DRIVER
1574 *	3/1R	3/1R	P	F	P	RELAY DRIVER
1575 *	3/1R	3/1R	P	F	P	RELAY DRIVER
1576 *	3/1R	3/1R	P	F	P	RELAY DRIVER
1577	3/3	3/3				RELAY DRIVER

(\*) Potential Critical Items.



# AIR DATA PROBE ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
1578 *	3/1R	3/1R	P	F	P	RELAY DRIVER
1579	3/3	3/3				RELAY DRIVER
1580 *	3/1R	3/1R	P	F	P	RELAY
1581 *	3/1R	3/1R	P	F	P	RELAY
1582 *	3/1R	3/1R	P	F	P	RELAY
1583 *	3/1R	3/1R	P	F	P	RELAY
1584 *	3/1R	3/1R	P	F	P	RELAY
1585	3/3	3/3				RELAY
1586 *	3/1R	3/1R	P	F	P	RELAY
1587	3/3	3/3				RELAY
1588	3/3	3/3				AND GATE
1589 *	3/1R	3/1R	P	F	P	AND GATE
1590	3/3	3/3				TIME DELAY
1591 *	3/1R	3/1R	P	F	P	TIME DELAY
1592	3/3	3/3				SOLID STATE DRIVER
1593 *	3/1R	3/1R	P	F	P	SOLID STATE DRIVER
1594	3/3	3/3				REMOTE POWER CONTROLLER
1595 *	3/1R	3/1R	P	F	P	REMOTE POWER CONTROLLER
1596	3/3	3/3				REMOTE POWER CONTROLLER
1597 *	3/1R	3/1R	P	F	P	REMOTE POWER CONTROLLER
1598	3/3	3/3				REMOTE POWER CONTROLLER
1599 *	3/1R	3/1R	P	F	P	REMOTE POWER CONTROLLER
1600	3/3	3/3				SWITCH RELAY
1601 *	3/1R	3/1R	P	F	P	SWITCH RELAY
1602	3/3	3/3				LATCH RELAY
1603 *	3/1R	3/1R	P	F	P	LATCH RELAY
1604	3/3	3/3				EMI FILTER
1605 *	3/1R	3/1R	P	F	P	EMI FILTER
1606	3/3	3/3				OP AMP
1607 *	3/1R	3/1R	P	F	P	OP AMP
1608	3/3	3/3				REGULATOR
1609 *	3/1R	3/1R	P	F	P	REGULATOR
1610 *	3/1R	3/1R	P	F	P	GENERATOR
1611 *	3/1R	3/1R	P	F	P	GENERATOR
1612 *	3/1R	3/1R	P	F	P	CLOCK
1613 *	3/1R	3/1R	P	F	P	CLOCK
1614	3/3	3/3				+Q TRANSISTOR
1615 *	3/1R	3/1R	P	F	P	+Q TRANSISTOR
1616	3/3	3/3				-Q TRANSISTOR
1617 *	3/1R	3/1R	P	F	P	-Q TRANSISTOR
1618	3/3	3/3				TRANSFORMER
1619 *	3/1R	3/1R	P	F	P	TRANSFORMER
1620	3/3	3/3				+10V AMP
1621 *	3/1R	3/1R	P	F	P	+10V AMP
1622	3/3	3/3				-10V AMP

(\*) Potential Critical Items.

# AIR DATA PROBE ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY	REDUNDANCY	SCREENS			ITEM NAME
	FLIGHT	ABORT				
	H/F	H/F	A	B	C	
1623 *	3/1R	3/1R	P	F	P	-10V AMP
1624	3/3	3/3				+10V TRANSISTOR
1625 *	3/1R	3/1R	P	F	P	+10V TRANSISTOR
1626	3/3	3/3				-10V TRANSISTOR
1627 *	3/1R	3/1R	P	F	P	-10V TRANSISTOR
1628	3/3	3/3				POWER SUPPLY TEST AMP
1629 *	3/1R	3/1R	P	F	P	POWER SUPPLY TEST AMP
1630	3/3	3/3				AMP
1631	3/3	3/3				AMP
1632	3/3	3/3				AMP
1633	3/3	3/3				AMP
1634	3/3	3/3				THERMISTER THERMOMETER
1635	3/3	3/3				THERMISTER THERMOMETER
1636	3/3	3/3				FIELD EFFECT TRANSISTOR
1637 *	3/1R	3/1R	P	F	P	FIELD EFFECT TRANSISTOR
1638	3/3	3/3				CONTROL CIRCUIT
1639 *	3/1R	3/1R	P	F	P	CONTROL CIRCUIT
1640 *	3/1R	3/1R	P	F	P	READ ONLY MEMORY
1641 *	3/1R	3/1R	P	F	P	READ ONLY MEMORY
1642	3/3	3/3				TRANSDUCER TEMP AMP
1643	3/3	3/3				TRANSDUCER TEMP AMP
1644	3/3	3/3				AMP
1645 *	3/1R	3/1R	P	F	P	AMP
1646	3/3	3/3				TRANSISTOR
1647 *	3/1R	3/1R	P	F	P	TRANSISTOR
1648 *	3/1R	3/1R	P	F	P	AND GATE
1649 *	3/1R	3/1R	P	F	P	AND GATE
1650 *	3/1R	3/1R	P	F	P	SERIAL SHIFT REGISTER
1651 *	3/1R	3/1R	P	F	P	SERIAL SHIFT REGISTER
1652 *	3/1R	3/1R	P	F	P	BINARY COUNTER
1653 *	3/1R	3/1R	P	F	P	BINARY COUNTER
1654 *	3/1R	3/1R	P	F	P	ADDRESSABLE SWITCH
1655 *	3/1R	3/1R	P	F	P	ADDRESSABLE SWITCH
1656 *	3/1R	3/1R	P	F	P	AMP
1657 *	3/1R	3/1R	P	F	P	AMP
1658 *	3/1R	3/1R	P	F	P	SWITCHING LADDER
1659 *	3/1R	3/1R	P	F	P	SWITCHING LADDER
1660 *	3/1R	3/1R	P	F	P	POLARITY DETECTOR
1661 *	3/1R	3/1R	P	F	P	POLARITY DETECTOR
1662 *	3/1R	3/1R	P	F	P	CONTROL LOGIC
1663 *	3/1R	3/1R	P	F	P	CONTROL LOGIC
1664 *	3/1R	3/1R	P	F	P	REGISTER
1665 *	3/1R	3/1R	P	F	P	REGISTER
1666 *	3/1R	3/1R	P	F	P	DISCREET INPUT BUFFER
1667 *	3/1R	3/1R	P	F	P	DISCREET INPUT BUFFER

(\*) Potential Critical Items.

# AIR DATA PROBE ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
1668 *	3/1R	3/1R	P	F	P	SERIAL/PARALLEL CONVERTER
1669 *	3/1R	3/1R	P	F	P	SERIAL/PARALLEL CONVERTER
1670 *	3/1R	3/1R	P	F	P	OSCILLATOR
1671 *	3/1R	3/1R	P	F	P	OSCILLATOR
1672 *	3/1R	3/1R	P	F	P	2 MH2 CLOCK
1673 *	3/1R	3/1R	P	F	P	2 MH2 CLOCK
1674 *	3/1R	3/1R	P	F	P	1 MH2 CLOCK
1675 *	3/1R	3/1R	P	F	P	1 MH2 CLOCK
1676 *	3/1R	3/1R	P	F	P	500 MH2 CLOCK
1677 *	3/1R	3/1R	P	F	P	500 MH2 CLOCK
1678 *	3/1R	3/1R	P	F	P	COUNTER
1679 *	3/1R	3/1R	P	F	P	COUNTER
1680 *	3/1R	3/1R	P	F	P	OR GATE
1681 *	3/1R	3/1R	P	F	P	OR GATE
1682 *	3/1R	3/1R	P	F	P	SENSOR WINDOW GENERATOR
1683 *	3/1R	3/1R	P	F	P	SENSOR WINDOW GENERATOR
1684 *	3/1R	3/1R	P	F	P	BUFFER
1685 *	3/1R	3/1R	P	F	P	BUFFER
1686 *	3/1R	3/1R	P	F	P	OUTPUT CONTROL
1687 *	3/1R	3/1R	P	F	P	OUTPUT CONTROL
1688 *	3/1R	3/1R	P	F	P	ENCODER
1689 *	3/1R	3/1R	P	F	P	ENCODER
1690 *	3/1R	3/1R	P	F	P	AMP
1691 *	3/1R	3/1R	P	F	P	AMP
1692 *	3/1R	3/1R	P	F	P	CPU
1693 *	3/1R	3/1R	P	F	P	CPU
1694 *	3/1R	3/1R	P	F	P	SELECTOR LOGIC
1695 *	3/1R	3/1R	P	F	P	SELECTOR LOGIC
1696 *	3/1R	3/1R	P	F	P	READ ONLY MEMORY
1697 *	3/1R	3/1R	P	F	P	ROM
1698 *	3/1R	3/1R	P	F	P	READ/WRITE MEMORY
1699 *	3/1R	3/1R	P	F	P	READ/WRITE MEMORY

(\*) Potential Critical Items.

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1101

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: MOTOR  
FAILURE MODE: FAILS TO OPERATE

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: MA.ADS.MTR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF MOTOR WILL CAUSE PROBE TO DEPLOY ON ONE MOTOR.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1102

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: GEARBOX  
FAILURE MODE: JAMMED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: MA.ADS.GB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
PROBE WILL NOT DEPLOY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1103

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: GEARBOX  
FAILURE MODE: BROKEN GEAR

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: MA.ADS.GB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
PROBE WILL NOT DEPLOY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1104

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: PRESSURE LINE  
FAILURE MODE: LEAKAGE

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: MA.ADS.PL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LEAKAGE OF THE PRESSURE LINE WILL RESULT IN INCORRECT PRESSURES  
BEING RECEIVED BY THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1105

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: PROBE  
FAILURE MODE: JAMMED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: MA.ADS.PR8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
PROBE WILL NOT DEPLOY.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1106

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: PROBE  
FAILURE MODE: CLOGGED PORT

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PRESSURE ASSEMBLY
- 3) AIR DATA SUBSYSTEM
- 4) MECHANICAL
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: MA.ADS.PRB

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:

BLOCKAGE OF THE PROBE PRESSURE PORTS WILL RESULT IN INCORRECT PRESSURES BEING RECEIVED BY THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1107

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: SHAFT  
FAILURE MODE: BROKEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: MA.ADS.SHF

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
PROBE WILL NOT DEPLOY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/11/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1108

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: SHAFT  
FAILURE MODE: BENT

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: MA.ADS.SHF

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

WILL CAUSE PROBE TO DEPLOY AT AN INCORRECT ATTITUDE. THIS WILL  
IN TURN CAUSE INCORRECT PRESSURES TO BE SENT TO THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1109

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DEPLOY MICROSWITCH  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: ADS.MCH.MS.DEP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

DISPLAYS WILL SHOW THAT AIR DATA PROBE IS ALWAYS DEPLOYED.

REFERENCES:

REPORT DATE 11/25/87

C-16

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP FLIGHT: 3/3  
MDAC ID: 1110 ABORT: 3/3

ITEM: DEPLOY MICROSWITCH  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: ADS.MCH.MS.DEP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
DISPLAYS WILL NEVER SHOW THAT AIR DATA PROBE IS DEPLOYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1111

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: STOW MICROSWITCH  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: ADS.MCH.MS.STW

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

DISPLAYS WILL SHOW THAT AIR DATA PROBE IS ALWAYS STOWED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP  
MDAC ID: 1112

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: STOW MICROSWITCH  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) MECHANICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD FUSELAGE  
PART NUMBER: ADS.MCH.MS.STW

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
DISPLAYS WILL NEVER SHOW THAT AIR DATA PROBE IS STOWED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1500

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1501

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE FROM DEPLOYING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1502

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
DEPLOYMENT OF AIR DATA PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1503 ABORT: 3/1R

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE FROM DEPLOYING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1504

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1505

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE FROM DEPLOYING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1506

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1507

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE FROM DEPLOYING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1508

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1509 ABORT: 3/1R

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1510

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/3	
LIFTOFF:	/	TAL:	3/3	
ONORBIT:	/	AOA:	3/3	
DEORBIT:	3/3	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1511

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1512

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/3
LIFTOFF:	/	TAL: 3/3
ONORBIT:	/	AOA: 3/3
DEORBIT:	3/3	ATO: /
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1513

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1514

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1515

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1516

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.STW.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
STOWAGE OF PROBE.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1517

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.STW.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1518

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.STW.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1519

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/3	
LIFTOFF:	/	TAL:	3/3	
ONORBIT:	/	AOA:	3/3	
DEORBIT:	3/3	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.STW.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1520

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.STW.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1521

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.STW.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1522

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.STW.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1523

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RP.STW.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1524

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE STOW
- 7) ENABLE POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RPS.EN.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
STOWAGE OF PROBE.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3  
MDAC ID: 1525 ABORT: 3/3

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE STOW
- 7) ENABLE POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RPS.EN.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE FAILURE TO STOW PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1526

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE STOW
- 7) ENABLE POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RPS.EN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1527

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE STOW
- 7) ENABLE POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RPS.EN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE FAILURE TO STOW PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1528

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE STOW
- 7) INHIBIT POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RPS.IN.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1529

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE STOW
- 7) INHIBIT POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RPS.IN.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1530

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE STOW
- 7) INHIBIT POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RPS.IN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1531

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE STOW
- 7) INHIBIT POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.RPS.IN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1532

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1533 ABORT: 3/1R

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE  
FROM DEPLOYING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1534

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1535

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE FROM DEPLOYING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1536

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
DEPLOYMENT OF AIR DATA PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1537 ABORT: 3/1R

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE FROM DEPLOYING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1538

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1539

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE FROM DEPLOYING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1540

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DH.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1541

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DH.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1542

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DH.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1543

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DH.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1544

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DH.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1545

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DH.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1546

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DH.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1547

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.DH.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1548

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.STW.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF THE PROBE.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1549

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.STW.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1550

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.STW.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1551

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.STW.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1552

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.STW.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1553

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.STW.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1554

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.STW.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1555

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.STW.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF PROBE.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1556

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE STOW
- 7) ENABLE POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.EN.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1557

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE STOW
- 7) ENABLE POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.EN.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE FAILURE TO STOW PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1558

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE STOW
- 7) ENABLE POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/1R			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.EN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1559

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE STOW
- 7) ENABLE POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.EN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE FAILURE TO STOW PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1560

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE STOW
- 7) INHIBIT POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.IN.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1561

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE STOW
- 7) INHIBIT POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.IN.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1562

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE STOW
- 7) INHIBIT POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/3
LIFTOFF:	/	TAL: 3/3
ONORBIT:	/	AOA: 3/3
DEORBIT:	3/3	ATO: /
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.IN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3  
MDAC ID: 1563 ABORT: 3/3

ITEM: CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE STOW
- 7) INHIBIT POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL C3  
PART NUMBER: ADS.DC.SW.LP.IN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1564

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE1.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED PROBE DEPLOYMENT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1565

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE1.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1566

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #2
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/1R
LIFTOFF:	/	TAL: 3/1R
ONORBIT:	/	AOA: 3/1R
DEORBIT:	3/1R	ATO: /
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE2.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
PROBE DEPLOYMENT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1567

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE2.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE PROBE.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1568

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #1
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST1.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1569

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST1.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT SUBSEQUENT FAILURES COULD PREVENT STOWING THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1570

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST2.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1571

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #2
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST2.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1572

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY DRIVER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #1
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/1R
LIFTOFF:	/	TAL: 3/1R
ONORBIT:	/	AOA: 3/1R
DEORBIT:	3/1R	ATO: /
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE1.RD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
PROBE DEPLOYMENT.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1573

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE1.RD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1574 ABORT: 3/1R

ITEM: RELAY DRIVER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE2.RD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
PROBE DEPLOYMENT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1575

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE2.RD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREENT DEPLOYMENT  
OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1576

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY DRIVER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #1
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST1.RD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1577

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: RELAY DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST1.RD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1578

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY DRIVER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST2.RD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3  
MDAC ID: 1579 ABORT: 3/3

ITEM: RELAY DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST2.RD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1580

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #1
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE1.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
PROBE DEPLOYMENT.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1581

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE1.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1582

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #2
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/1R
LIFTOFF:	/	TAL: 3/1R
ONORBIT:	/	AOA: 3/1R
DEORBIT:	3/1R	ATO: /
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE2.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
PROBE DEPLOYMENT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1583

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.DE2.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1584

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST1.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1585

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: RELAY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #1
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST1.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1586

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: RELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST2.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1587

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: RELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #2
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.MCA.ST2.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF PROBE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1588

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: AND GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1589

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: AND GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3  
MDAC ID: 1590 ABORT: 3/3

ITEM: TIME DELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.TD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1591

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: TIME DELAY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.TD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1592

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: SOLID STATE DRIVER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.SSD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1593

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: SOLID STATE DRIVER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.SSD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3  
MDAC ID: 1594 ABORT: 3/3

ITEM: REMOTE POWER CONTROLLER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5) 320W HEATER
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.RPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1595 ABORT: 3/1R

ITEM: REMOTE POWER CONTROLLER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5) 320W HEATER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.RPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1596

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: REMOTE POWER CONTROLLER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5) 270W HEATER
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.270.RPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1597

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: REMOTE POWER CONTROLLER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5) 270W HEATER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.270.RPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONOUES OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3  
MDAC ID: 1598 ABORT: 3/3

ITEM: REMOTE POWER CONTROLLER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5) 330W HEATER
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/3
LIFTOFF:	/	TAL: 3/3
ONORBIT:	/	AOA: 3/3
DEORBIT:	3/3	ATO: /
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.330.RPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1599 ABORT: 3/1R

ITEM: REMOTE POWER CONTROLLER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5) 330W HEATER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.330.RPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1600

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: SWITCH RELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.SRL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1601 ABORT: 3/1R

ITEM: SWITCH RELAY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.SRL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1602

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: LATCH RELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.LRL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1603

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: LATCH RELAY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.HCA.LRL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECTS. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1604

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: EMI FILTER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/3	
LIFTOFF:	/	TAL:	3/3	
ONORBIT:	/	AOA:	3/3	
DEORBIT:	3/3	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.FIL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1605 ABORT: 3/1R

ITEM: EMI FILTER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.FIL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1606

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: OP AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.OA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1607 ABORT: 3/1R

ITEM: OP AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.OA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1608

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: REGULATOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.REG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1609

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: REGULATOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.REG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1610

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: GENERATOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.GEN

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1611

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: GENERATOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.GEN

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1612

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: CLOCK  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/1R			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.CLK

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1613

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: CLOCK  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.CLK

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1614

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +Q TRANSISTOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.+QT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1615

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +Q TRANSISTOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.+QT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1616

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: -Q TRANSISTOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.-QT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1617 ABORT: 3/1R

ITEM: -Q TRANSISTOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.-QT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1618

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: TRANSFORMER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.TMR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1619

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: TRANSFORMER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.TMR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1620

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +10V AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.+AM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1621

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: +10V AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.+AM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1622

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: -10V AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.-AM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1623

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: -10V AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.-AM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1624

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: +10V TRANSISTOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.+TR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1625 ABORT: 3/1R

ITEM: +10V TRANSISTOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.+TR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1626

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: -10V TRANSISTOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/3
LIFTOFF:	/	TAL: 3/3
ONORBIT:	/	AOA: 3/3
DEORBIT:	3/3	ATO: /
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.-TR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1627 ABORT: 3/1R

ITEM: -10V TRANSISTOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.PS.-TR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1628

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: POWER SUPPLY TEST AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1629 ABORT: 3/1R

ITEM: POWER SUPPLY TEST AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF ONE ADTA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1630

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TEMP BRIDGE
- 6) HIGH INPUT
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TB.HA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1631

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TEMP BRIDGE
- 6) HIGH INPUT
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TB.HA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TEMPERATURE DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1632

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TEMP BRIDGE
- 6) LOW INPUT
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/3
LIFTOFF:	/	TAL: 3/3
ONORBIT:	/	AOA: 3/3
DEORBIT:	3/3	ATO: /
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TB.LA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1633

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TEMP BRIDGE
- 6) LOW INPUT
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TB.LA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TEMPERATURE DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3  
MDAC ID: 1634 ABORT: 3/3

ITEM: THERMISTER THERMOMETER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.TT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3  
MDAC ID: 1635 ABORT: 3/3

ITEM: THERMISTER THERMOMETER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.TT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER TEMPERATURE DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3  
MDAC ID: 1636 ABORT: 3/3

ITEM: FIELD EFFECT TRANSISTOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/3	
LIFTOFF:	/	TAL:	3/3	
ONORBIT:	/	AOA:	3/3	
DEORBIT:	3/3	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.FET

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1637 ABORT: 3/1R

ITEM: FIELD EFFECT TRANSISTOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.FET

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1638

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: CONTROL CIRCUIT  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/3
LIFTOFF:	/	TAL: 3/3
ONORBIT:	/	AOA: 3/3
DEORBIT:	3/3	ATO: /
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.CC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1639

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: CONTROL CIRCUIT  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.CC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1640

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: READ ONLY MEMORY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.ROM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1641 ABORT: 3/1R

ITEM: READ ONLY MEMORY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.ROM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1642

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: TRANSDUCER TEMP AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.TTA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER TEMPERATURE DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1643

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: TRANSDUCER TEMP AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.TTA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER TEMPERATURE DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1644

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1645 ABORT: 3/1R

ITEM: AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3  
MDAC ID: 1646 ABORT: 3/3

ITEM: TRANSISTOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1647

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: TRANSISTOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1648

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: AND GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1649

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: AND GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1650

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: SERIAL SHIFT REGISTER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/1R
LIFTOFF:	/	TAL: 3/1R
ONORBIT:	/	AQA: 3/1R
DEORBIT:	3/1R	ATO: /
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.SSR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1651 ABORT: 3/1R

ITEM: SERIAL SHIFT REGISTER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.SSR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1652

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: BINARY COUNTER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7).
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.BC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1653

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: BINARY COUNTER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.TC.BC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1654

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: ADDRESSABLE SWITCH  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.AS

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1655

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: ADDRESSABLE SWITCH  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.AS

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1656

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1657

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1658

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: SWITCHING LADDER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.SL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1659 ABORT: 3/1R

ITEM: SWITCHING LADDER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.SL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1660

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: POLARITY DETECTOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.PD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1661

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: POLARITY DETECTOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.PD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1662

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: CONTROL LOGIC  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1663

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: CONTROL LOGIC  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1664

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: REGISTER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.REG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1665

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: REGISTER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.AD.REG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1666 ABORT: 3/1R

ITEM: DISCREET INPUT BUFFER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DIB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1667 ABORT: 3/1R

ITEM: DISCREET INPUT BUFFER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DIB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1668

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: SERIAL/PARALLEL CONVERTER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.SPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1669 ABORT: 3/1R

ITEM: SERIAL/PARALLEL CONVERTER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.SPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1670

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: OSCILLATOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.OSC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1671

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: OSCILLATOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.OSC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1672

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: 2 MH2 CLOCK  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.2CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1673

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: 2 MH2 CLOCK  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.2CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1674

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: 1 MH2 CLOCK  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.1CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1675

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: 1 MH2 CLOCK  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.1CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1676

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: 500 MH2 CLOCK  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.5CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1677

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: 500 MH2 CLOCK  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.5CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1678

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: COUNTER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.CNT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1679

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: COUNTER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.CNT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1680

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: OR GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.OG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1681

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: OR GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.OG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1682 ABORT: 3/1R

ITEM: SENSOR WINDOW GENERATOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.SWG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1683 ABORT: 3/1R

ITEM: SENSOR WINDOW GENERATOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.CG.SWG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1684

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: BUFFER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DO.BUF

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1685

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: BUFFER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DO.BUF

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1686

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: OUTPUT CONTROL  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DO.OC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1687

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: OUTPUT CONTROL  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DO.OC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1688

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: ENCODER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DO.ENC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1689

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: ENCODER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DO.ENC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1690

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DO.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1691

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DO.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1692

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: CPU  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DO.CPU

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1693

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: CPU  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DO.CPU

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1694

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: SELECTOR LOGIC  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL PROCESSOR
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DP.SL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1695 ABORT: 3/1R

ITEM: SELECTOR LOGIC  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL PROCESSOR
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DP.SL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1696 ABORT: 3/1R

ITEM: READ ONLY MEMORY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL PROCESSOR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DP.ROM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R  
MDAC ID: 1697 ABORT: 3/1R

ITEM: ROM  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL PROCESSOR
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DP.ROM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1698

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: READ/WRITE MEMORY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL PROCESSOR
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DP.RWM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/31/87  
SUBSYSTEM: MECH/ADP/EPD&C  
MDAC ID: 1699

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: 3/1R

ITEM: READ/WRITE MEMORY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL PROCESSOR
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/1R
LIFTOFF:	/		TAL:	3/1R
ONORBIT:	/		AOA:	3/1R
DEORBIT:	3/1R		ATO:	/
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: FORWARD AVIONICS BAYS  
PART NUMBER: ADS.ADT.DP.RWM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF TRANSDUCER DATA.

REFERENCES:

C.2

ELEVON SEALS PANEL ANALYSIS WORKSHEETS



# ELEVON SEALS PANEL ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT	ABORT	SCREENS			
	H/F	H/F	A	B	C	
2100 *	1/1	1/1				ROD ASSEMBLY
2101 *	1/1	1/1				ROD ASSEMBLY
2102 *	1/1	1/1				BELLCRANK
2103 *	1/1	1/1				BELLCRANK
2104 *	1/1	1/1				BOLT
2105 *	1/1	1/1				BOLT
2106	3/3	3/3				ALL ITEMS NOT SHOWN ON MDAC ID

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 (\*) Potential Critical Items.

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ESP FLIGHT: 1/1  
MDAC ID: 2100 ABORT: 1/1

ITEM: ROD ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE,  
BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ELEVON SEAL PANEL LINKAGE
- 3) ROD ASSEMBLY
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	2/2	RTLS:	1/1
LIFTOFF:	2/2	TAL:	1/1
ONORBIT:	2/2	AOA:	1/1
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: OUTBOARD ELEVON SEAL PANELS  
PART NUMBER: V070-596009-007/008, 10-001/013, 70-001/005, 77-001  
(42 TOTAL)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF  
OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES  
OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS  
ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL,  
VEHICLES/CREW.

REFERENCES: V070-596008

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ESP FLIGHT: 1/1  
MDAC ID: 2101 ABORT: 1/1

ITEM: ROD ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE,  
BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ELEVON SEAL PANEL LINKAGE
- 3) ROD ASSEMBLY
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	2/2		RTLS:	1/1
LIFTOFF:	2/2		TAL:	1/1
ONORBIT:	2/2		AOA:	1/1
DEORBIT:	1/1		ATO:	1/1
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: INBOARD ELEVON SEAL PANELS  
PART NUMBER: V070-596003-001/016, 80-001/007, 82-001/004, 87-  
001/007 (50 TOTAL)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF  
OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES  
OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS  
ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL,  
VEHICLES/CREW.

REFERENCES: V070-596001

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ESP FLIGHT: 1/1  
MDAC ID: 2102 ABORT: 1/1

ITEM: BELLCRANK  
FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE,  
BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ELEVON SEAL PANEL LINKAGE
- 3) BELLCRANKS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	2/2		RTLS:	1/1
LIFTOFF:	2/2		TAL:	1/1
ONORBIT:	2/2		AOA:	1/1
DEORBIT:	1/1		ATO:	1/1
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: OUTBOARD ELEVON SEAL PANELS  
PART NUMBER: V070-596011-001/4, 12-005/006, 14-001/002, 22-  
001/002, 23-001/006 (16 TOTAL)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF  
OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES  
OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS  
ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL,  
VEHICLES/CREW.

REFERENCES: V070-596008

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ESP FLIGHT: 1/1  
MDAC ID: 2103 ABORT: 1/1

ITEM: BELLCRANK  
FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE,  
BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ELEVON SEAL PANEL LINKAGE
- 3) BELLCRANKS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	2/2	RTLS: 1/1
LIFTOFF:	2/2	TAL: 1/1
ONORBIT:	2/2	AOA: 1/1
DEORBIT:	1/1	ATO: 1/1
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: INBOARD ELEVON SEAL PANELS  
PART NUMBER: V070-596004-001/002, 005-001/006, 006-001/002, 007-  
001/002, 024-001/002, 025-001/002, 026-001/002, 027-001/002, 028-  
001/002 (18 TOTAL)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF  
OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES  
OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS  
ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL,  
VEHICLES/CREW.

REFERENCES: V070-596001

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ESP FLIGHT: 1/1  
MDAC ID: 2104 ABORT: 1/1

ITEM: BOLT  
FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE,  
BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ELEVON SEAL PANEL LINKAGE
- 3) BOLTS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	2/2		RTLS:	1/1
LIFTOFF:	2/2		TAL:	1/1
ONORBIT:	2/2		AOA:	1/1
DEORBIT:	1/1		ATO:	1/1
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: OUTBOARD ELEVON SEAL PANELS  
PART NUMBER: V070-596083-001-4; MD111-1001-0416, 18, 19; 0515-  
19, 0616-18, 22; MD111-1002-0413 (100 TOTAL)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF  
OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES  
OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS  
ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL,  
VEHICLES/CREW.

REFERENCES: V070-596008

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ESP FLIGHT: 1/1  
MDAC ID: 2105 ABORT: 1/1

ITEM: BOLT  
FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE,  
BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ELEVON SEAL PANEL LINKAGE
- 3) BOLTS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/2	RTLS:	1/1
LIFTOFF:	2/2	TAL:	1/1
ONORBIT:	2/2	AOA:	1/1
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: INBOARD ELEVON SEAL PANELS  
PART NUMBER: V070-596083-001-4; MD111-1001-0418, 19, -0516-18,  
23, 27, -0616, 18, 22, 27; MD111-1002-0517 (118 TOTAL)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF  
OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES  
OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS  
ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL,  
VEHICLES/CREW.

REFERENCES: V070-596001

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ESP FLIGHT: 3/3  
MDAC ID: 2106 ABORT: 3/3

ITEM: ALL ITEMS NOT SHOWN ON MDAC ID 100-105 (WASHER,  
BUSHING, NUT, COTTER PIN, SAFETY WIRE, ETC)  
FAILURE MODE: ALL FAILURE MODES

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ELEVON SEAL PANEL LINKAGE
- 3) ALL REMAINING PARTS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: INBOARD/OUTBOARD ELEVON SEAL PANELS  
PART NUMBER: ALL PARTS NOT SHOWN ON MDAC ID 100-105

CAUSES: ALL CAUSES

EFFECTS/RATIONALE:  
FAILURE OF ALL PARTS NOT SHOWN ON MDAC ID 100-105 WILL HAVE NO  
EFFECT ON MISSION, VEHICLE OR CREW.

REFERENCES: V070-596001/8



C.3

ET UMBILICAL ANALYSIS WORKSHEETS

# ET UMBILICAL ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
3101 *	2/1R	2/1R	P	P	P	CENTERLINE LATCH MOTOR
3102 *	2/1R	2/1R	P	F	P	CENTERLINE MOTOR CLUTCH
3103	3/3	3/3				CENTERLINE MOTOR CLUTCH
3104	3/3	3/3				CENTERLINE MOTOR BRAKE
3105 *	2/1R	2/1R	P	P	P	CENTERLINE MOTOR BRAKE
3106 *	1/1	1/1				CL LATCH DIFFERENTIAL/GEARBOX
3107 *	1/1	1/1				CL LATCH DIFFERENTIAL/GEARBOX
3108 *	1/1	1/1				CENTERLINE LATCH
3109 *	2/1R	2/1R	P	P	P	CENTERLINE LATCH LIMIT SWITCH
3110	3/3	3/3				CENTERLINE LATCH LIMIT SWITCH
3111 *	2/1R	2/1R	P	P	P	DOOR CLOSURE MOTOR
3112 *	2/1R	2/1R	P	P	P	DOOR CLOSURE MOTOR CLUTCH
3113	3/3	3/3				DOOR CLOSURE MOTOR CLUTCH
3114	3/3	3/3				DOOR CLOSURE MOTOR BRAKE
3115 *	2/1R	2/1R	P	P	P	DOOR CLOSURE MOTOR BRAKE
3116 *	1/1	1/1				TLC/DIFFERENTIAL/GEARBOX
3117 *	1/1	1/1				TLC/DIFFERENTIAL/GEARBOX
3118 *	1/1	1/1				DOOR LINKAGE ASSEMBLY
3119 *	1/1	1/1				DOOR LINKAGE ASSEMBLY
3120 *	1/1	1/1				HINGE LINKAGE ASSEMBLY
3121 *	1/1	1/1				HINGE LINKAGE ASSEMBLY
3122 *	1/1	1/1				CLOSURE TORQUE TUBE ASSEMBLY
3123 *	1/1	1/1				CLOSURE TORQUE TUBE ASSEMBLY
3124 *	2/1R	2/1R	P	P	P	DOOR CLOSURE LIMIT SWITCH
3125	3/3	3/3				DOOR CLOSURE LIMIT SWITCH
3126 *	1/1	1/1				DOOR HINGE
3127 *	1/1	1/1				DOOR HINGE
3128 *	1/1	1/1				DOOR UPLATCH ROLLER
3129 *	1/1	1/1				UMBILICAL DOOR
3130 *	2/1R	2/1R	P	P	P	UPLOCK LATCH MOTOR
3131 *	2/1R	2/1R	P	P	P	UPLATCH MOTOR CLUTCH
3132	3/3	3/3				UPLATCH MOTOR CLUTCH
3133	3/3	3/3				UPLATCH MOTOR BRAKE
3134 *	2/1R	2/1R	P	P	P	UPLATCH MOTOR BRAKE
3135 *	1/1	1/1				TLC/DIFFERENTIAL/GEARBOX
3136 *	1/1	1/1				TLC/DIFFERENTIAL/GEARBOX
3137 *	1/1	1/1				UPLATCH TORQUE TUBE ASSEMBLY
3138 *	1/1	1/1				UPLATCH TORQUE TUBE ASSEMBLY
3139 *	1/1	1/1				INBOARD UPLOCK LATCH LINKAGE
3140 *	1/1	1/1				INBOARD UPLOCK LATCH LINKAGE
3141 *	1/1	1/1				UPLOCK LATCH MECHANISM
3142 *	1/1	1/1				UPLOCK LATCH MECHANISM
3143 *	2/1R	2/1R	P	F	P	READY TO LATCH LIMIT SWITCH
3144	3/3	3/3				READY TO LATCH LIMIT SWITCH
3501 *	2/1R	2/1R	P	F	P	RELAY

(\*) Potential Critical Items.

# ET UMBILICAL ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
3502	3/3	3/3				RELAY
3503 *	2/1R	2/1R	P	F	P	RELAY
3504	3/3	3/3				RELAY
3505	3/3	3/3				ET UMBILICAL DOOR MODE SWITCH
3506	3/3	3/3				ET UMBILICAL DOOR MODE SWITCH
3507 *	2/1R	2/1R	P	P	P	CENTERLINE LATCH-STOW SWITCH
3508	3/3	3/3				CENTERLINE LATCH-STOW SWITCH
3509 *	2/1R	2/1R	P	P	P	ETUD OPEN-CLOSE SWITCH
3510	3/3	3/3				ETUD OPEN-CLOSE SWITCH
3511 *	2/1R	2/1R	P	P	P	ETUD OPEN-CLOSE SWITCH
3512 *	2/1R	2/1R	P	P	P	ETUD LATCH-RELEASE SWITCH
3513	3/3	3/3				ETUD LATCH-RELEASE SWITCH
3514 *	2/1R	2/1R	P	P	P	ETUD LATCH-RELEASE SWITCH
3515 *	2/1R	2/1R	P	F	P	CONTROL BUS FUSE
3516 *	2/1R	2/1R	P	P	P	MCA AC POWER CIRCUIT BREAKER
3517 *	2/1R	2/1R	P	P	P	MCA RELAY LOGIC POWER SWITCH
3518	3/3	3/3				MCA RELAY LOGIC POWER SWITCH
3519 *	2/1R	2/1R	P	F	P	REMOTE POWER CONTROLLER
3520	3/3	3/3				HYBRID CIRCUIT DRIVER
3521	3/3	3/3				HYBRID CIRCUIT DRIVER
3522 *	2/1R	2/1R	F	F	P	DIODE
3523	3/3	3/3				DIODE
3524 *	2/1R	2/1R	P	F	P	RESISTOR, 5.1K 1/4W
3525 *	2/1R	2/1R	F	F	P	RESISTOR, 5.1K 1/4W
3526 *	2/1R	2/1R	F	F	P	RESISTOR, 5.1K 1/4W
3527 *	2/1R	2/1R	P	F	P	FUSE, 1A, ACTUATOR STATUS
3528 *	2/1R	2/1R	P	F	P	RESISTOR, 1.2K, MCA LOGIC SW
3529 *	2/1R	2/1R	P	F	P	RESISTOR, 1.2K, MCA LOGIC SW

(\*) Potential Critical Items.

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R  
MDAC ID: 3101 ABORT: 2/1R

ITEM: CENTERLINE LATCH MOTOR  
FAILURE MODE: FAILS TO START

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH MOTOR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
LOSS OF OUTPUT, VIBRATION

EFFECTS/RATIONALE:

LOSS OF A CENTERLINE LATCH MOTOR WOULD RESULT IN SECOND MOTOR  
STOWING THE LATCH AT A REDUCED RATE. LOSS OF SECOND MOTOR WOULD  
PREVENT STOWING CENTERLINE LATCH AND CLOSING OF UMBILICAL DOOR.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3102

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: CENTERLINE MOTOR CLUTCH  
FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE MOTOR CLUTCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF CLUTCH TO ENGAGE WOULD REDUCE POWER TRANSFER FOR LATCH  
STOWING. REDUNDANT MOTOR WOULD STOW LATCH BUT AT A REDUCED RATE.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 3/3  
MDAC ID: 3103 ABORT: 3/3

ITEM: CENTERLINE MOTOR CLUTCH  
FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE MOTOR CLUTCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 3/3
LIFTOFF:	/	TAL: 3/3
ONORBIT:	/	AOA: 3/3
DEORBIT:	3/3	ATO: /
LANDING/SAFING:	/	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:  
CLUTCH FAILING TO DISENGAGE WOULD REDUCE REDUNDANCY. LATCH  
RELEASE AND STOWING WOULD BE COMPLETED. NO EFFECT ON  
ORBITER/CREW OR MISSION.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3104

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: CENTERLINE MOTOR BRAKE  
FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE MOTOR BRAKE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF BRAKE TO ENGAGE AND HOLD CENTERLINE LATCH IN STOWED  
POSITION COULD RESULT IN DAMAGE TO LATCH ON ENTRY. NO EFFECT ON  
ORBITER/CREW OR MISSION.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3105

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: CENTERLINE MOTOR BRAKE  
FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE MOTOR BRAKE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF BRAKE TO DISENGAGE WOULD REDUCE POWER TRANSFER FOR  
LATCH STOWING. REDUNDANT MOTOR WOULD STOW LATCH BUT AT A REDUCED  
RATE.

REFERENCES: JSC-11174



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3106 ABORT: 1/1

ITEM: CENTERLINE LATCH DIFFERENTIAL/GEAR ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH DIFFERENTIAL/GEAR ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	1/1
LIFTOFF:	/		TAL:	1/1
ONORBIT:	/		AOA:	1/1
DEORBIT:	1/1		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:

BINDING/JAMMING WOULD PREVENT CENTERLINE LATCH FROM STOWING AND  
UMBILICAL DOOR FROM CLOSING. HEAT COULD ENTER UMBILICAL CAVITY  
ON ENTRY. POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: JSC-11174

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3107

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 1/1  
ABORT: 1/1

ITEM: CENTERLINE LATCH DIFFERENTIAL/GEAR ASSEMBLY  
FAILURE MODE: PARTIAL OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH DIFFERENTIAL/GEAR ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:

PARTIAL TRANSMISSION OF MOTOR POWER WOULD SLOW LATCH OPERATION.  
MOTORS REACH STALL TIME BEFORE LATCH REACHES STOWED POSITION  
PREVENTING DOOR CLOSURE. POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3108

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 1/1  
ABORT: 1/1

ITEM: CENTERLINE LATCH  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565062-001/V070-565062-002

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF LATCH ON ASCENT OR BEFORE LATCH CLEARS UMBILICAL DOOR PREVENTS CLOSURE WHICH WOULD CAUSE LOSS OF ORBITER/CREW. FAILURE AFTER LATCH CLEARS DOOR AT WORST WOULD CAUSE DAMAGE TO LATCH DUE TO AERODYNAMIC HEATING ON ENTRY.

REFERENCES: V070-565000

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R  
MDAC ID: 3109 ABORT: 2/1R

ITEM: CENTERLINE LATCH LIMIT SWITCH  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	2/1R	
LIFTOFF:	/	TAL:	2/1R	
ONORBIT:	/	AOA:	2/1R	
DEORBIT:	2/1R	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, ERRONEOUS INPUT, MECHANICAL SHOCK, PIECE-  
PART FAILURE, VIBRATION, INADVERTENT OPERATION

EFFECTS/RATIONALE:  
PREMATURE CLOSING OF CENTERLINE LATCH LIMIT SWITCH WOULD CAUSE  
MOTOR TO STOP. SECOND MOTOR WOULD STOW LATCH BUT AT A REDUCED  
RATE.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 3/3  
MDAC ID: 3110 ABORT: 3/3

ITEM: CENTERLINE LATCH LIMIT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

MOTOR WOULD CONTINUE TO OPERATE UNTIL LATCH REACHES LIMIT, MOTOR  
WOULD STALL. LATCH WOULD MOVE TO STOWED POSITION.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3111

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: DOOR CLOSURE MOTOR  
FAILURE MODE: FAILS TO START

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) DOOR CLOSURE MECHANISM
- 4) DOOR CLOSE MOTOR
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

LOSS OF UMBILICAL DOOR CLOSURE MOTOR WOULD RESULT IN SECOND MOTOR  
CLOSING THE UMBILICAL DOOR AT A REDUCED RATE. LOSS OF SECOND  
MOTOR WOULD PREVENT CLOSING OF UMBILICAL DOOR.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R  
MDAC ID: 3112 ABORT: 2/1R

ITEM: DOOR CLOSURE MOTOR CLUTCH  
FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MACHANISM
- 4) DOOR CLOSURE MOTOR CLUTCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	2/1R
LIFTOFF:	/		TAL:	2/1R
ONORBIT:	/		AOA:	2/1R
DEORBIT:	2/1R		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF CLUTCH TO ENGAGE WOULD REDUCE POWER TRANSFER FOR DOOR  
CLOSURE. REDUNDANT MOTOR WOULD CLOSE DOOR AT REDUCED RATE.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3113

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DOOR CLOSURE MOTOR CLUTCH  
FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MACHANISM
- 4) DOOR CLOSURE MOTOR CLUTCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

CLUTCH FAILING TO DISENGAGE WOULD REDUCE REDUNDANCY. UMBILICAL  
DOOR CLOSURE WOULD BE COMPLETED. NO EFFECT ON ORBITER/CREW OR  
MISSION.

REFERENCES: JSC-11174



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 3/3  
MDAC ID: 3114 ABORT: 3/3

ITEM: DOOR CLOSURE MOTOR BRAKE  
FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MACHANISM
- 4) DOOR CLOSURE MOTOR BRAKE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:  
BRAKE FAILURE TO ENGAGE UPON DOOR CLOSURE WOULD HAVE NO EFFECT ON  
ORBITER/CREW OR MISSION.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R  
MDAC ID: 3115 ABORT: 2/1R

ITEM: DOOR CLOSURE MOTOR BRAKE  
FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MACHANISM
- 4) DOOR CLOSURE MOTOR BRAKE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	2/1R	
LIFTOFF:	/	TAL:	2/1R	
ONORBIT:	/	AOA:	2/1R	
DEORBIT:	2/1R	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF BRAKE TO DISENGAGE WOULD REDUCE POWER TRANSFER FOR  
UMBILICAL DOOR CLOSURE. REDUNDANT MOTOR WOULD CLOSE DOOR BUT AT  
A REDUCED RATE.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3116 ABORT: 1/1

ITEM: TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: 1/1
LIFTOFF:	/	TAL: 1/1
ONORBIT:	/	AOA: 1/1
DEORBIT:	1/1	ATO: /
LANDING/SAFING:	/	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:  
BINDING/JAMMING WOULD PREVENT DOOR CLOSURE. ALLOWS HEAT TO ENTER  
UMBILICAL CAVITY ON ENTRY. LOSS OF CREW/VEHICLE.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3117 ABORT: 1/1

ITEM: TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY  
FAILURE MODE: PARTIAL OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	1/1
LIFTOFF:	/		TAL:	1/1
ONORBIT:	/		AOA:	1/1
DEORBIT:	1/1		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
PARTIAL INPUT, VIBRATION

EFFECTS/RATIONALE:

PARTIAL TRANSMISSION OF MOTOR POWER WOULD SLOW UMBILICAL DOOR  
CLOSURE. DOOR CLOSURE MOTORS REACH STALL TIME BEFORE DOOR  
CLOSED. IF UNABLE TO CLOSE DOOR THEN THE LOSS OF CREW/VEHICLE IS  
POSSIBLE.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3118 ABORT: 1/1

ITEM: DOOR LINKAGE ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) DOOR LINKAGE ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565017-003/V070-565001-001/V070565001-002/V070-565002-001/V070-565002-002

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, VIBRATION

EFFECTS/RATIONALE:  
BINDING/JAMMING WOULD PREVENT DOOT FROM BEING CLOSED. HEAT ENTERS UMBILICAL CAVITY DURING ENTRY. LOSS OF CREW/VEHICLE.

REFERENCES: V070-56500

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3119 ABORT: 1/1

ITEM: DOOR LINKAGE ASSEMBLY  
FAILURE MODE: LINKAGE BROKEN/UNATTACHED

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) DOOR LINKAGE ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565017-003/V070-565001-001/V070565001-002/V070-565002-001/V070-565002-002

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, THERMAL SHOCK, ACCELERATION, VIBRATION

EFFECTS/RATIONALE:

BROKEN/UNATTACHED DOOR LINKAGE PREVENTS DOOR CLOSURE OR ALLOWS CLOSURE BUT DOOR CANNOT SEAL OPENING ALLOWING HEAT TO ENTER UMBILICAL CAVITY DURING ENTRY. POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-56500

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3120 ABORT: 1/1

ITEM: HINGE LINKAGE ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) HINGE LINKAGE ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	1/1
LIFTOFF:	/		TAL:	1/1
ONORBIT:	/		AOA:	1/1
DEORBIT:	1/1		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565017-001/V070-565017-004

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:  
BINDING/JAMMING WOULD PREVENT DOOR FROM BEING CLOSED. OPEN  
UMBILICAL DOOR ALLOWS HEAT TO ENTER UMBILICAL CAVITY ON ENTRY.  
POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-56500

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3121 ABORT: 1/1

ITEM: HINGE LINKAGE ASSEMBLY  
FAILURE MODE: LINKAGE BROKEN/UNATTACHED

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) HINGE LINKAGE ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565017-001/V070-565017-004

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, THERMAL SHOCK,  
VIBRATION

EFFECTS/RATIONALE:  
BROKEN/UNATTACHED HINGE LINKAGE PREVENTS DOOR CLOSURE OR ALLOWS  
CLOSURE BUT DOOR CANNOT SEAL OPENING ALLOWING HEAT TO ENTER  
UMBILICAL CAVITY. POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-56500



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3122 ABORT: 1/1

ITEM: DOOR CLOSURE TORQUE TUBE ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) DOOR CLOSURE TORQUE TUBE ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	1/1
LIFTOFF:	/		TAL:	1/1
ONORBIT:	/		AOA:	1/1
DEORBIT:	1/1		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565010

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:

BINDING/JAMMING OF TORQUE TUBE ASSEMBLY PREVENTS DOOR CLOSURE  
BECAUSE ALL DOOR CLOSURE LINKAGES ARE DRIVEN BY TORQUE TUBE. ON  
ENTRY HEAT COULD ENTER UMBILICAL CAVITY. POSSIBLE LOSS OF  
CREW/VEHICLE.

REFERENCES: V070-56500

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3123 ABORT: 1/1

ITEM: DOOR CLOSURE TORQUE TUBE ASSEMBLY  
FAILURE MODE: TORQUE TUBE BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) DOOR CLOSURE TORQUE TUBE ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565010

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION,  
VIBRATION

EFFECTS/RATIONALE:

BROKEN TORQUE TUBE PREVENTS DOOR CLOSURE BECAUSE ALL LINKAGES ARE  
DRIVEN BY TORQUE TUBE. ON ENTRY HEAT COULD ENTER UMBILICAL  
CAVITY. LOSS OF CREW/VEHICLE.

REFERENCES: V070-56500

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R  
MDAC ID: 3124 ABORT: 2/1R

ITEM: DOOR CLOSURE LIMIT SWITCH  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) DOOR CLOSURE MECHANISM
- 4) DOOR CLOSURE LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, ERRONEOUS INPUT, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, INADVERTENT OPERATION

EFFECTS/RATIONALE:

PREMATURE CLOSING OF DOOR CLOSURE LIMIT SWITCH WOULD CAUSE MOTOR TO STOP. SECOND MOTOR WOULD CLOSE DOOR BUT AT A REDUCED RATE.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3125

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DOOR CLOSURE LIMIT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) DOOR CLOSURE MECHANISM
- 4) DOOR CLOSURE LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/3	
LIFTOFF:	/	TAL:	3/3	
ONORBIT:	/	AOA:	3/3	
DEORBIT:	3/3	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

DOOR CLOSURE MOTOR WOULD NOT RECEIVE CUTOFF COMMAND WHEN  
UMBILICAL DOOR CLOSURES. ALSO LOSE SIGNAL OF DOOR CLOSURE WITH  
APPLICABLE MISC SHOWING DOOR OPEN. PROCEDURE IS MANUAL ON  
NOMINAL MISSION AND AUTOMATIC DURING AN ABORT SO THERE IS NO  
EFFECT ON  
ORBITER/CREW OR MISSION.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3126 ABORT: 1/1

ITEM: DOOR HINGE  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) DOOR CLOSURE MECHANISM
- 4) DOOR HINGE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565030-003

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:  
BINDING/JAMMING DOOR HINGE PREVENTS DOOR CLOSURE. DOOR ALLOWS  
HEAT TO ENTER UMBILICAL CAVITY ON ENTRY. LOSS OF CREW/VEHICLE.

REFERENCES: V070-565000

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3127

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 1/1  
ABORT: 1/1

ITEM: DOOR HINGE  
FAILURE MODE: STRUCTURAL FAILURE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) DOOR CLOSURE MECHANISM
- 4) DOOR HINGE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565030-003

CAUSES: MECHANICAL SHOCK, STRUCTURAL FAILURE, THERMAL SHOCK,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF A HINGE WOULD PREVENT DOOR CLOSURE OR NOT SEAL THE  
DOOR IN THE OPENING. HEAT COULD ENTER UMBILICAL CAVITY DURING  
ENTRY. POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-565000

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3128 ABORT: 1/1

ITEM: DOOR UPLATCH ROLLER  
FAILURE MODE: BROKEN OFF DOOR COMPLETELY/PARTIALLY

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) DOOR CLOSURE MECHANISM
- 4) DOOR UPLATCH ROLLER
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565160-001 & 002/V070-565166-001 & 002/1070-565167-001 & 002

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, VIBRATION

EFFECTS/RATIONALE:  
COMPLETE OR PARTIAL LOSS OF AN UPLATCH ON ASCENT PREVENT LATCHING DOOR INTO PLACE. HEAT COULD ENTER UMBILICAL CAVITY ON ENTRY.  
LOSS OF CREW/VEHICLE.

REFERENCES: V070-565000

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/16/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3129

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 1/1  
ABORT: 1/1

ITEM: UMBILICAL DOOR  
FAILURE MODE: DAMAGED ON ASCENT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) UMBILICAL DOOR
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	1/1
LIFTOFF:	/		TAL:	1/1
ONORBIT:	/		AOA:	1/1
DEORBIT:	1/1		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, STRUCTURAL FAILURE, THERMAL SHOCK,  
VIBRATION

EFFECTS/RATIONALE:

DAMAGE TO UMBILICAL DOOR CAUSES LOSS OF TILES OR WARPS DOOR.  
ALLOWS HEAT TO ENTER UMBILICAL CAVITY DUE TO MISSING TILES OR  
INABILITY OF DOOR TO CLOSE SECURELY. LOSS OF CREW/VEHICLE.

REFERENCES: V070-565000

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R  
MDAC ID: 3130 ABORT: 2/1R

ITEM: UPLOCK LATCH MOTOR  
FAILURE MODE: FAILS TO START

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) UPLOCK LATCH MOTOR
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF UPLATCH MOTOR WOULD MEAN SECOND MOTOR WOULD LATCH  
DOORS SECURE AT A REDUCED RATE. ONLY EFFECT IS LOSS OF  
REDUNDANCY.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3131

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: UPLATCH MOTOR CLUTCH  
FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) UPLATCH MOTOR CLUTCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF CLUTCH TO ENGAGE WOULD REDUCE POWER TRANSFER FOR  
DRIVING UPLATCH MECHANISM. REDUNDANT MOTOR WOULD LATCH DOORS BUT  
AT A REDUCED RATE.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 3/3  
MDAC ID: 3132 ABORT: 3/3

ITEM: UPLATCH MOTOR CLUTCH  
FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) UPLATCH MOTOR CLUTCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

CLUTCH FAILING TO DISENGAGE WOULD REDUCE REUNDANCY. UPLOCK  
LATCHING WOULD BE COMPLETED. NO EFFECT ON ORBITER/CREW OR  
MISSION.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3133

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: UPLATCH MOTOR BRAKE  
FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) UPLATCH MOTOR BRAKE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:  
FAILURE OF UPLATCH MOTOR BRAKE TO ENGAGE WOULD HAVE NO EFFECT.  
SECOND MOTOR AND LATCH MECHANISMS WOULD SECURE DOOR.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R  
MDAC ID: 3134 ABORT: 2/1R

ITEM: UPLATCH MOTOR BRAKE  
FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) UPLATCH MOTOR BRAKE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

BRAKE FAILING TO DISENGAGE AT START OF UPLATCH MOTOR OPERATION  
WOULD RESULT IN SECOND MOTOR LATCHING THE DOOR AT A REDUCED RATE.  
FAILURE REDUCES REDUNDANCY.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3135

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 1/1  
ABORT: 1/1

ITEM: TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	1/1	
LIFTOFF:	/	TAL:	1/1	
ONORBIT:	/	AOA:	1/1	
DEORBIT:	1/1	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:

BINDING/JAMMING WOULD PREVENT DOOR LATCHING. DOOR WOULD NOT BE  
SECURELY CLOSED ALLOWING IT TO OPEN OR NOT SEAL PROPERLY. ALLOWS  
HEAT TO ENTER UMBILICAL CAVITY DURING ENTRY. LOSS OF  
CREW/VEHICLE.

REFERENCES: JSC-11174

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3136 ABORT: 1/1

ITEM: TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY  
FAILURE MODE: PARTIAL OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	1/1
LIFTOFF:	/		TAL:	1/1
ONORBIT:	/		AOA:	1/1
DEORBIT:	1/1		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
PARTIAL INPUT, VIBRATION

EFFECTS/RATIONALE:

PARTIAL TRANSMISSION OF MOTOR POWER WOULD SLOW DOOR LATCHING.  
MOTORS REACH STALL TIME LIMIT BEFORE DOOR LATCHED. IF UMBILICAL  
DOORS NOT CLOSED HEAT COULD ENTER UMBILICAL CAVITY ON ENTRY.  
POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3137

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 1/1  
ABORT: 1/1

ITEM: UPLATCH TORQUE TUBE ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) UPLATCH TORQUE TUBE ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565130-001/V070-565130-002

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:

BINDING/JAMMING OF TORQUE TUBE ASSEMBLY PREVENTS DOOR BEING  
LATCHED DUE TO OUTBOARD UPLOCK LATCH MECHANISMS BEING DRIVEN BY  
TORQUE TUBE ASSEMBLY. UMBILICAL DOOR NOT SECURELY LATCHED COULD  
OPEN OR NOT SEAL CLOSED ALLOWING HEAT TO ENTER UMBILICAL CAVITY.

REFERENCES: V070-565000



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3138 ABORT: 1/1

ITEM: UPLATCH TORQUE TUBE ASSEMBLY  
FAILURE MODE: TORQUE TUBE BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) UPLATCH TORQUE TUBE ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565130-001/V070-565130-002

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION,  
VIBRATION

EFFECTS/RATIONALE:  
BROKEN TORQUE TUBE PREVENTS DOOR LATCHING BECAUSE INBOARD UPLATCH  
LOCK MECHANISM IS DRIVEN BY TORQUE TUBE ASSEMBLY. ON ENTRY HEAT  
COULD ENTER UMBILICAL CAVITY. LOSS OF CREW/VEHICLE.

REFERENCES: V070-565000

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3139

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 1/1  
ABORT: 1/1

ITEM: INBOARD UPLOCK LATCH LINKAGE  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) INBOARD UPLOCK LATCH MECHANISM
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565144-001/V070-565144-002

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:

BINDING/JAMMING OF LINKAGE PREVENTS OPERATION OF INBOARD LATCH  
CAPTURE AND SECURING UMBILICAL DOORS IN THE CLOSED POSITION.  
UMBILICAL DOOR COULD OPEN ALLOWING HEAT TO ENTER DURING ENTRY.  
POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-565000

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3140 ABORT: 1/1

ITEM: INBOARD UPLOCK LATCH LINKAGE  
FAILURE MODE: BROKEN/UNATTACHED

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) INBOARD UPLOCK LATCH MECHANISM
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565144-001/V070-565144-002

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION,  
VIBRATION

EFFECTS/RATIONALE:

BROKEN/UNATTACHED LINKAGE PREVENTS CAPTURE OF INBOARD ROLLER AND  
SECURE DOOR LATCH. UMBILICAL DOOR COULD OPEN AND ALLOW HEAT TO  
ENTER UMBILICAL CAVITY DURING ENTRY. POSSIBLE LOSS OF  
CREW/VEHICLE.

REFERENCES: V070-565000

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3141 ABORT: 1/1

ITEM: UPLOCK LATCH MECHANISM  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565102-001 & 002/V070-565103-001 & 002/V070-565104-001 & 002

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
ACCELERATION, VIBRATION

EFFECTS/RATIONALE:  
BINDING/JAMMING PREVENTS CAPTURE OF ROLLER ON DOOR. WITHOUT  
SECURE LATCH DOOR MAY OPEN ON ENTRY ALLOWING HEAT TO ENTER  
UMBILICAL CAVITY. POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-56500

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 1/1  
MDAC ID: 3142 ABORT: 1/1

ITEM: UPLOCK LATCH MECHANISM  
FAILURE MODE: BROKEN/UNATTACHED

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	1/1
LIFTOFF:	/	TAL:	1/1
ONORBIT:	/	AOA:	1/1
DEORBIT:	1/1	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER: V070-565102-001 & 002/V070-565103-001 & 002/V070-565104-001 & 002

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION,  
VIBRATION

EFFECTS/RATIONALE:  
BROKEN/UNATTACHED LATCH MECHANISM PREVENTS DOOR BEING LATCHED.  
DOOR MAY OPEN ON ENTRY ALLOWING HEAT TO ENTER UMBILICAL CAVITY.  
POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-56500

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87  
SUBSYSTEM: MECH/ETUD  
MDAC ID: 3143

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: READY TO LATCH LIMIT SWITCH  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) READY TO LATCH LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, ERRONEOUS INPUT, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, INADVERTENT OPERATION

EFFECTS/RATIONALE:

PREMATURE INDICATION OF READY TO LATCH WOULD CAUSE MOTOR TO STOP. REDUNDANT MOTOR WOULD CONTINUE TO CAPTURE ROLLER BUT AT A REDUCED RATE. EFFECT IS A LOSS OF REDUNDANCY. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: V070-56500

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/17/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD FLIGHT: 3/3  
MDAC ID: 3144 ABORT: 3/3

ITEM: READY TO LATCH LIMIT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) READY TO LATCH LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE TO INDICATE READY TO LATCH CAUSES CONTINUED MOTOR  
OPERATION. LATCH MECHANISM WILL CONTACT A STOP AND STALL MOTOR.  
NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: V070-56500

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3501 ABORT: 2/1R

ITEM: RELAY  
FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) MOTOR CONTROL ASSEMBLY
- 4) RELAY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AFT FUSELAGE, AVIONICS BAYS 4, 5, 6  
PART NUMBER: K7-K10, K12-K18, K57, K59

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

RELAY IS USED TO STOW THE CENTERLINE LATCHES, CLOSING THE UMBILICAL DOORS, OR ENGAGING THE UPLOCK LATCHES. FAILURE OF RELAY CAUSES AN OPEN CIRCUIT AND THE LOSS OF AC POWER TO A MOTOR. THE REDUNDANT MOTOR CONTINUES THE PARTICULAR FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87  
SUBSYSTEM: MECH/ETUD/EPD&C  
MDAC ID: 3502

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: RELAY  
FAILURE MODE: FAILS TO OPEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) MOTOR CONTROL ASSEMBLY
- 4) RELAY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE, AVIONICS BAYS 4, 5, 6  
PART NUMBER: K7-K10, K12-K18, K57, K59

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF RELAY TO OPEN HAS NO EFFECT ON CREW/VEHICLE OR  
MISSION. POWER CAN BE REMOVED FROM A MOTOR WHEN SECOND RELAY  
OPENS FOR CENTERLINE LATCH STOWING AND UPLOCK LATCH ENGAGEMENT.  
DOOR CLOSURE RELAY DOES NOT HAVE REDUNDANCY BUT POWER CAN BE  
REMOVED BY FLIGHT DECK SWITCHES.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87  
SUBSYSTEM: MECH/ETUD/EPD&C  
MDAC ID: 3503

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: RELAY  
FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) MOTOR CONTROL ASSEMBLY
- 4) RELAY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	/	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AFT FUSELAGE, AVIONICS BAYS 4, 5, 6  
PART NUMBER: K5, K6, K10-K12, K14, K15, K17-K20, K56, K58

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

RELAY IS USED TO LOCK THE CENTERLINE LATCHES, OPENING THE UMBILICAL DOORS, OR RELEASE THE UPLOCK LATCHES. THE ET UMBILICAL DOORS MUST BE OPENED ASAP POSTLANDING WHEN A TAL OR RTLS OCCURS AND FOR ALL OTHER CASES IF THERE IS AN INDICATION OF H2 BUILDUP. RELAY FAILURE REDUCES REDUNDANCY. SECOND MOTOR WOULD CONTINUE THE FUNCTION BUT AT A SLOWER RATE. NO EFFECT ON CREW/VEHICLE.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3  
MDAC ID: 3504 ABORT: 3/3

ITEM: RELAY  
FAILURE MODE: FAILS TO OPEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) MOTOR CONTROL ASSEMBLY
- 4) RELAY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	/	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT FUSELAGE, AVIONICS BAYS 4, 5, 6  
PART NUMBER: K5, K6, K10-K12, K14, K15, K17-K20, K56, K58

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

RELAY IS USED TO LOCK THE CENTERLINE LATCHES, OPENING THE ET  
UMBILICAL DOORS, OR RELEASE THE UPLOCK LATCHES. FAILURE OF RELAY  
TO OPEN HAS NO EFFECT ON CREW/VEHICLE. POWER CAN BE REMOVED BY  
OTHER MEANS POSTLANDING.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3  
MDAC ID: 3505 ABORT: 3/3

ITEM: ET UMBILICAL DOOR MODE SWITCH  
FAILURE MODE: FAILS TO SWITCH FROM GPC TO MANUAL MODE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) ET UMBILICAL DOOR MODE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: S47

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF ET UMBILICAL DOOR MODE SWITCH TO MOVE FROM GPC TO MANUAL MODE HAS NO EFFECT ON CREW/VEHICLE OR MISSION. SWITCH FAILING IN THE GPC MODE WILL NOT PREVENT ET UMBILICAL DOOR CLOSURE. THE NECESSARY COMMANDS CAN BE SENT TO THE ORBITER FROM MCC. SWITCH IS IN GPC MODE ON ASCENT TO ALLOW GNC SOFTWARE TO CLOSE THE DOORS DURING AN RTLS. THIS MODE IS ALSO USED FOR REAL-TIME UP-LINK COMMANDS TO CLOSE ET UMBILICAL DOORS, IS REDUNDANT CLOSURE PROCEDURE.

REFERENCES: VS70-560109, VS72-956099

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3  
MDAC ID: 3506 ABORT: 3/3

ITEM: ET UMBILICAL DOOR MODE SWITCH  
FAILURE MODE: FAILS TO SWITCH FROM MANUAL TO GPC MODE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) ET UMBILICAL DOOR MODE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: S47

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF ET UMBILICAL DOOR MODE SWITCH TO MOVE FROM MANUAL TO GPC MODE HAS NO EFFECT ON CREW/VEHICLE OR MISSION. SWITCH FAILING IN THE MANUAL MODE KEEPS SUPPLYING RELAY LOGIC POWER FROM THE FOUR CONTROL BUSES. THIS POWER CAN BE TAKEN OFF LINE BY SWITCHING OFF THREE MCA LOGIC SWITCHES (SWITCHES S4, S10, S14 ON PANEL MA73CB). IF POWER IS LEFT ON-LINE, MANUAL OPERATION OF UMBILICAL DOORS AND UPLOCK LATCHES IS POSSIBLE.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3507 ABORT: 2/1R

ITEM: CENTELRINE LATCH-STOW SWITCH  
FAILURE MODE: FAILS TO SWITCH FROM GND TO STOW

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) CENTERLINE LATCH-STOW SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	2/1R
ONORBIT:	/		AOA:	2/1R
DEORBIT:	2/1R		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: S48

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM GND TO STOW PREVENTS THE FOUR  
CONTROL BUSES FROM SUPPLYING RELAY LOGIC POWER TO THE AFT MOTOR  
CONTROLLERS. THIS PREVENTS MANUAL CENTELRINE LATCH STOWING. NO  
EFFECT ON CREW/VEHICLE OR MISSION BECAUSE OF ALTERNATIVE GPC MODE  
OF DOOR CLOSURE.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3  
MDAC ID: 3508 ABORT: 3/3

ITEM: CENTELRINE LATCH-STOW SWITCH  
FAILURE MODE: FAILS TO SWITCH FROM STOW TO GND

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) CENTERLINE LATCH-STOW SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: S48

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM STOW TO GND HAS NO EFFECT ON  
CREW/VEHICLE OR MISSION. SWITCH ENABLES OPERATION OF THE TWO  
CENTERLINE LATCHES ACTUATORS. WHEN ET UMBILICAL DOOR MODE SWITCH  
(S47) IS IN GPC MODE THIS WILL DISABLE THE CENTERLINE LATCH-STOW  
SWITCH.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3509 ABORT: 2/1R

ITEM: ET UMBILICAL DOOR OPEN-CLOSE SWITCH  
FAILURE MODE: FAILS TO SWITCH FROM OFF TO CLOSE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) ET UMBILICAL DOOR OPEN-CLOSE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: S49 (LEFT), S51 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM OFF TO CLOSE PREVENTS THE FOUR  
CONTROL BUSES FROM SUPPLYING RELAY LOGIC POWER. THIS PREVENTS  
MANUAL CLOSING OF THE LEFT AND RIGHT ET UMBILICAL DOORS. NO  
EFFECT ON CREW/VEHICLE OR MISSION BECAUSE OF ALTERNATIVE GPC  
MODE OF DOOR CLOSURE.

REFERENCES: VS70-560109, VS72-956099



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3  
MDAC ID: 3510 ABORT: 3/3

ITEM: ET UMBILICAL DOOR OPEN-CLOSE SWITCH  
FAILURE MODE: FAILS TO SWITCH FROM CLOSE TO OFF

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) ET UMBILICAL DOOR OPEN-CLOSE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	3/3
LIFTOFF:	/		TAL:	3/3
ONORBIT:	/		AOA:	3/3
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: S49 (LEFT), S51 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM CLOSE TO OFF HAS NO EFFECT ON  
CREW/VEHICLE OR MISSION. OFF SWITCH POSITION REMOVES RELAY LOGIC  
POWER FOR MANUAL DOOR OPERATION. WHEN ET UMBILICAL DOOR MODE  
SWITCH (S47) IS IN GPC MODE THIS WILL DISABLE LEFT/RIGHT ET  
UMBILICAL DOOR OPEN-CLOSE SWITCH.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3511 ABORT: 2/1R

ITEM: ET UMBILICAL DOOR OPEN-CLOSE SWITCH  
FAILURE MODE: FAILS TO SWITCH FROM OFF TO OPEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) ET UMBILICAL DOOR OPEN-CLOSE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	2/1R
LIFTOFF:	/		TAL:	2/1R
ONORBIT:	/		AOA:	2/1R
DEORBIT:	/		ATO:	/
LANDING/SAFING:	2/1R			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: S49 (LEFT), S51 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

THE ET UMBILICAL DOORS MUST BE OPENED ASAP POSTLANDING WHEN A TAL  
OR RTLS OCCURS AND FOR ANY OTHER CASE IF THER IS AN INDICATION OF  
H2 BUILDUP. POSSIBLE LOSS OR DAMAGE TO ORBITER MAY OCCUR IF  
UNABLE TO OPEN UMBILICAL DOOR TO RELEASE THE H2.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3512 ABORT: 2/1R

ITEM: ET UMBILICAL DOOR LATCH-RELEASE SWITCH  
FAILURE MODE: FAILS TO SWITCH FROM OFF TO LATCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) ET UMBILICAL DOOR LATCH-RELEASE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: S50 (LEFT), S52 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM OFF TO LATCH PREVENTS THE FOUR  
CONTROL BUSES FROM SUPPLYING RELAY LOGIC POWER. THIS PREVENTS  
MANUAL LATCHING OF THE LEFT AND RIGHT ET UMBILICAL DOORS. NO  
EFFECT ON CREW/VEHICLE OR MISSION BECAUSE OF ALTERNATIVE GPC  
MODE OF DOOR CLOSURE.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3  
MDAC ID: 3513 ABORT: 3/3

ITEM: ET UMBILICAL DOOR LATCH-RELEASE SWITCH  
FAILURE MODE: FAILS TO SWITCH FROM LATCH TO OFF

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) ET UMBILICAL DOOR LATCH-RELEASE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: S50 (LEFT), S52 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM LATCH TO OFF HAS NO EFFECT ON  
CREW/VEHICLE OR MISSION. OFF SWITCH POSITION REMOVES RELAY LOGIC  
POWER FOR MANUAL DOOR OPERATION. WHEN ET UMBILICAL DOOR MODE  
SWITCH (S47) IS IN GPC MODE THIS WILL DISABLE ET UMBILICAL DOOR  
LATCH-RELEASE SWITCH.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3514 ABORT: 2/1R

ITEM: ET UMBILICAL DOOR LATCH-RELEASE SWITCH  
FAILURE MODE: FAILS TO SWITCH FROM OFF TO RELEASE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) ET UMBILICAL DOOR LATCH-RELEASE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	/	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: S50 (LEFT), S52 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

THE ET UMBILICAL DOORS MUST BE OPENED ASAP POSTLANDING WHEN A TAL OR RTLS OCCURS AND FOR ANY OTHER CASE IF THERE IS AN INDICATION OF H2 BUILDUP. POSSIBLE LOSS OR DAMAGE TO ORBITER MAY OCCUR IF UNABLE TO UNLATCH AND OPEN UMBILICAL DOOR TO RELEASE THE H2.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3515 ABORT: 2/1R

ITEM: CONTROL BUS FUSE  
FAILURE MODE: FAILS OUT OF TOLERANCE, OPEN (ELECTRICAL)

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) CONTROL BUS FUSE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: ORBITER COCKPIT PANEL R2  
PART NUMBER: F36, F37, F38, F39

CAUSES: CONTAMINATION, OVERLOAD, PIECE-PART FAILURE, VIBRATION,  
MECHANICAL SHOCK

EFFECTS/RATIONALE:

BLOWN FUSE REDUCES REDUNDANCY. REDUNDANT CONTROL BUSES WOULD STILL BE ABLE TO SUPPLY NEEDED POWER FOR CENTERLINE LATCH, DOOR MOVEMENT AND UPLOCK LATCH FUNCTIONS. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3516 ABORT: 2/1R

ITEM: MCA AC POWER CIRCUIT BREAKER  
FAILURE MODE: FAILS OUT OF TOLERANCE, OPEN (ELECTRICAL)

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) AC BUS
- 5) MCA AC POWER CIRCUIT BREAKER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL MA73CD  
PART NUMBER: CB4, CB10, CB14

CAUSES: OVERLOAD, PIECE-PART FAILURE, INADVERTENT OPERATION

EFFECTS/RATIONALE:

FAILURE OF CIRCUIT BREAKER CAUSES LOSS OF THE THREE PHASE AC POWER FROM THE MAIN AC BUS. THIS CAUSES THE LOSS OF 4 MOTORS. REDUNDANT MOTORS WILL COMPLETE FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3517 ABORT: 2/1R

ITEM: MCA RELAY LOGIC POWER SWITCH  
FAILURE MODE: FAILS OFF

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) CONTROL BUS
- 5) MCA RELAY LOGIC POWER SWITCH
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL MA73CB  
PART NUMBER: S4, S10, S14

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

SWITCH FAILING IN THE OFF POSITION CAUSES THE LOSS OF CONTROL  
SIGNAL TO THE ASSOCIATED RPC. SECOND RPC ALLOWS CONTINUED  
OPERATION FOR A FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON  
CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3  
MDAC ID: 3518 ABORT: 3/3

ITEM: MCA RELAY LOGIC POWER SWITCH  
FAILURE MODE: FAILS ON

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) CONTROL BUS
- 5) MCA RELAY LOGIC POWER SWITCH
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/3	
LIFTOFF:	/	TAL:	3/3	
ONORBIT:	/	AOA:	3/3	
DEORBIT:	3/3	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL MA73CB  
PART NUMBER: S4, S10, S14

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

SWITCH FAILING IN THE ON POSITION HAS NO EFFECT ON CREW/VEHICLE  
OR MISSION. THE USE OF OTHER COCKPIT SWITCHES AND CIRCUIT  
BREAKERS WILL PREVENT INADVERTENT ET UMBILICAL DOOR OPERATION.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87  
SUBSYSTEM: MECH/ETUD/EPD&C  
MDAC ID: 3519

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: REMOTE POWER CONTROLLER  
FAILURE MODE: FAILS OFF

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) CONTROL BUS
- 5) MCA RELAY LOGIC POWER SWITCH
- 6) REMOTE POWER CONTROLLER
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

LOSS OF A REMOTE POWER CONTROLLER CAUSES A LOSS OF REDUNDANCY.  
SECOND RPC CONTINUES OPERATING REDUNDANT MOTORS. NO EFFECT ON  
CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3  
MDAC ID: 3520 ABORT: 3/3

ITEM: HYBRID CIRCUIT DRIVER  
FAILURE MODE: FAILS OFF

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) HYBRID CIRCUIT DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	/	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT AVIONICS BAY 4, AFT AVIONICS BAY 5  
PART NUMBER: AR3, AR6, AR3-AR5, AR4, AR5, AR21

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

HYBRID CIRCUIT DRIVER FAILING OFF HAS NO EFFECT ON CREW/VEHICLE  
OR MISSION. DEVICE IS USED TO DRIVE FLIGHT DECK TALKBACK  
INDICATORS. LOSS OF ONE DEVICE REDUCES REDUNDANCY, SECOND DEVICE  
WILL DRIVE TALKBACK. STATUS OF CENTERLINE LATCHES AND  
READY-TO-LATCH SWITCHES IS ALSO AVAILABLE FROM TELEMETRY AND GPC  
TM.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87  
SUBSYSTEM: MECH/ETUD/EPD&C  
MDAC ID: 3521

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: HYBRID CIRCUIT DRIVER  
FAILURE MODE: FAILS ON

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) HYBRID CIRCUIT DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/3	
LIFTOFF:	/	TAL:	3/3	
ONORBIT:	/	AOA:	3/3	
DEORBIT:	3/3	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT AVIONICS BAY 4, AFT AVIONICS BAY 5  
PART NUMBER: AR3, AR6, AR3-AR5, AR4, AR5, AR21

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

HYBRID CIRCUIT DRIVER FAILING ON HAS NO EFFECT ON CREW/VEHICLE OR MISSION. IF FAILURE OCCURS BEFORE DUAL MOTOR OPERATION TIME HAS ELAPSED A PREMATURE TALKBACK INDICATION WOULD OCCUR. SINCE TELEMETRY AND GPC TM WOULD NOT CONFIRM FUNCTION HAD BEEN COMPLETED CREW CAN CONTINUE UMBILICAL DOOR CLOSURE.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3522 ABORT: 2/1R

ITEM: DIODE  
FAILURE MODE: OPEN CIRCUIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) AFT MOTOR CONTROL ASSEMBLY
- 4) DIODE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 1 ] B [ F ] C [ P ]

LOCATION: AFT AVIONICS BAYS 4, 5, 6  
PART NUMBER: SEE REFERENCES

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

OPEN CIRCUIT FAILURE MODE CAUSES A LOSS OF INPUT TO LOGIC GATES.  
LOSS OF A LOGIC GATE CAUSES A LOSS OF AN ACTUATING MOTOR.  
REDUNDANT DIODE WILL ALLOW CONTINUED ACTUATOR MOTOR OPERATION,  
FUNCTION WILL BE COMPLETED BUT A REDUCED RATE. NO EFFECT ON  
CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87  
SUBSYSTEM: MECH/ETUD/EPD&C  
MDAC ID: 3523

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DIODE  
FAILURE MODE: SHORTED OUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) AFT MOTOR CONTROL ASSEMBLY
- 4) DIODE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/3	
LIFTOFF:	/	TAL:	3/3	
ONORBIT:	/	AOA:	3/3	
DEORBIT:	3/3	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT AVIONICS BAYS 4, 5, 6  
PART NUMBER: SEE REFERENCES

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

SHORTED OUT DIODE HAS NO EFFECT ON CREW/VEHICLE OR MISSION. IN MANUAL MODE FOR CLOSING AND LATCHING THE ET UMBILICAL DOORS A SHORTED DIODE WOULD ALLOW POWER TO REACH THE LOGIC CIRCUIT FOR THE OPPOSITE FUNCTION. SINCE THER WOULD BE NO INPUTS TO THE LOGIC GATES THE FAILURE DOES NOT HAVE ANY EFFECT. THE SAME SITUATION OCCURS IF THE GPC MODE IS ACTIVE.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3524 ABORT: 2/1R

ITEM: RESISTOR, 5.1K 1/4W  
FAILURE MODE: SHORTS, RESISTANCE LOWER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) AFT MOTOR CONTROL ASSEMBLY
- 4) RESISTOR, 5.1K 1/4W
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AFT AVIONICS BAYS 4, 5, 6  
PART NUMBER: SEE REFERENCES

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR THAT SHORTS OR WITH RESISTANCE LOWER THAN RATED VALUE WOULD ALLOW EXCESSIVE CURRENT TO REACH OTHER COMPONENTS. CURRENT WOULD BE MORE THAN COMPONENTS WERE DESIGNED FOR. HIGHER CURRENT CAUSES LOSS OF COMPONENTS AND LOSS OF FUNCTION. REDUNDANT ELEMENTS WILL CONTINUE OPERATION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87  
SUBSYSTEM: MECH/ETUD/EPD&C  
MDAC ID: 3525

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: RESISTOR, 5.1K 1/4W  
FAILURE MODE: OPEN CIRCUIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) AFT MOTOR CONTROL ASSEMBLY
- 4) RESISTOR, 5.1K 1/4W
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	2/1R
LIFTOFF:	/		TAL:	2/1R
ONORBIT:	/		AOA:	2/1R
DEORBIT:	2/1R		ATO:	/
LANDING/SAFING:	2/1R			

REDUNDANCY SCREENS: A [ 1 ] B [ F ] C [ P ]

LOCATION: AFT AVIONICS BAYS 4, 5, 6  
PART NUMBER: SEE REFERENCES

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR FAILURE AS AN OPEN CIRCUIT WOULD CAUSE A LOSS OF CURRENT TO OTHER COMPONENTS. THIS RESULTS IN A LOSS OF REDUNDANCY WHEN AFFECTED COMPONENT CANNOT OPERATE. REDUNDANT ELEMENTS WILL CONTINUE OPERATION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3526 ABORT: 2/1R

ITEM: RESISTOR, 5.1K 1/4W  
FAILURE MODE: RESISTANCE HIGHER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) AFT MOTOR CONTROL ASSEMBLY
- 4) RESISTOR, 5.1K 1/4W
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	2/1R
LIFTOFF:	/		TAL:	2/1R
ONORBIT:	/		AOA:	2/1R
DEORBIT:	2/1R		ATO:	/
LANDING/SAFING:	2/1R			

REDUNDANCY SCREENS: A [ 1 ] B [ F ] C [ P ]

LOCATION: AFT AVIONICS BAYS 4, 5, 6  
PART NUMBER: SEE REFERENCES

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTANCE HIGHER THAN RATED VALUE CAUSES A LOSS OF CURRENT. INPUT TO LOGIC GATE WOULD BE LESS THAN NOMINAL CAUSING A FALSE OUTPUT. RELAY WOULD NOT BE CLOSED CAUSING A LOSS OF A ACTUATOR MOTOR. REDUNDANT ELEMENT WOULD CONTINUE OPERATION WITH FUNCTION CONTINUING AT A SLOWER RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3527 ABORT: 2/1R

ITEM: FUSE, 1A, TO ACTUATOR STATUS SWITCH  
FAILURE MODE: BLOWN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) AFT MOTOR CONTROL ASSEMBLY
- 4) FUSE, 1A, TO ACTUATOR STATUS SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AFT AVIONICS BAYS 4, 5, 6  
PART NUMBER: F1, F4, F2, F1, F3, F2, F6, F5, F6, F1, F5, F7

CAUSES: VIBRATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

FUSE FAILURE CAUSES AN OPEN CIRCUIT. EFFECT IS A LOSS OF INPUT TO LOGIC CIRCUIT CONTROLLING AC POWER RELAYS TO ACTUATOR MOTOR. OPEN CIRCUIT WILL SIGNAL PREMATURE COMPLETION OF ACTUATOR FUNCTION. REDUNDANT MOTOR WILL COMPLETE FUNCTION BUT AT A REDUCED RATE. WILL GET PREMATURE TELEMETRY INDICATION OF ACTUATOR STATUS FROM ONE PART OF PAIR. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3528 ABORT: 2/1R

ITEM: RESISTOR, 1.2K, TO MCA LOGIC SWITCH  
FAILURE MODE: SHORTS, RESISTANCE LOWER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) CONTROL BUS
- 4) RESISTOR, 1.2K, TO MCA LOGIC SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: VIBRATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR THAT SHORTS OR WITH RESISTANCE LOWER THAN RATED VALUE WOULD ALLOW EXCESSIVE CURRENT TO REACH RPC. THIS CAUSES RPC CURRENT LIMITING TO TRIP OUT. RPC LOSS CAUSES LOSS OF AMC AND ASSOCIATED MOTOR RELAYS. REDUNDANT ELEMENTS WOULD CONTINUE OPERATION WITH FUNCTION COMPLETED AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R  
MDAC ID: 3529 ABORT: 2/1R

ITEM: RESISTOR, 1.2K, TO MCA LOGIC SWITCH  
FAILURE MODE: OPEN CIRCUIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) CONTROL BUS
- 4) RESISTOR, 1.2K, TO MCA LOGIC SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: VIBRATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR FAILURE AS AN OPEN CIRCUIT WOULD CAUSE A LOSS OF INPUT TO ASSOCIATED RPC. LOSS OF RPC IN TURN CAUSES LOSS OF AMC AND ASSOCIATED MOTOR RELAYS. REDUNDANT ELEMENTS WOULD CONTINUE OPERATION WITH FUNCTION COMPLETED AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS70-560109, VS72-956099

C.4

KU-BAND DEPLOY ANALYSIS WORKSHEETS

# KU-BAND DEPLOY ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
4101 *	1/1	3/3				GUILLOTINE/PRESSURE CARTRIDGE
4102 *	2/2	3/3				GUILLOTINE/PRESSURE CARTRIDGE
4103 *	1/1	3/3				NUT/BREECH
4104 *	1/1	1/1				NUT/BREECH
4105 *	2/1R	3/3	P	P	P	INPUT/OUTPUT SHAFT - HOUSING
4106 *	2/1R	3/3	P	P	P	INPUT/OUTPUT SHAFT - HOUSING
4107	3/1R	3/3	P	P	P	STOW LIMIT SWITCHES (S1 & 2)
4108	3/3	3/3				STOW LIMIT SWITCHES (S1 & 2)
4109 *	2/1R	3/3	P	P	P	DEPLOY LIMIT SWITCHES (S5 & 6)
4110 *	2/1R	3/3	P	P	P	DEPLOY LIMIT SWITCHES (S5 & 6)
4111 *	2/1R	3/3	P	P	P	GEAR TRAIN ASSEMBLY
4112 *	2/1R	3/3	P	P	P	GEAR TRAIN ASSEMBLY
4113	3/3	3/3				ALL ITEMS NOT SHOWN ON MDAC ID
4500	3/3	/NA				+28V CONTACT #1
4501	3/3	/NA				+28V CONTACT #1
4502	3/3	/NA				+28V CONTACT #2
4503	3/3	/NA				+28V CONTACT #2
4504	3/3	/NA				+28V CONTACT #3
4505	3/3	/NA				+28V CONTACT #3
4506	3/3	/NA				+28V CONTACT #4
4507	3/3	/NA				+28V CONTACT #4
4508 *	3/2R	/NA	P	F	P	+28V CONTACT #1
4509 *	3/1R	/NA	P	F	P	+28V CONTACT #1
4510 *	3/2R	/NA	P	F	P	+28V CONTACT #2
4511 *	3/1R	/NA	P	F	P	+28V CONTACT #2
4512 *	3/2R	/NA	P	F	P	+28V CONTACT #3
4513 *	3/1R	/NA	P	F	P	+28V CONTACT #3
4514 *	3/2R	/NA	P	F	P	+28V CONTACT #4
4515 *	3/1R	/NA	P	F	P	+28V CONTACT #4
4516 *	3/1R	/NA	P	F	P	+28V CONTACT #1
4517 *	3/2R	/NA	P	F	P	+28V CONTACT #1
4518 *	3/1R	/NA	P	F	P	+28V CONTACT #2
4519 *	3/2R	/NA	P	F	P	+28V CONTACT #2
4520 *	3/1R	/NA	P	F	P	+28V CONTACT #3
4521 *	3/2R	/NA	P	F	P	+28V CONTACT #3
4522 *	3/1R	/NA	P	F	P	+28V CONTACT #4
4523 *	3/2R	/NA	P	F	P	+28V CONTACT #4
4524	3/3	/NA				+28V CONTACT #1
4525 *	3/2R	/NA	P	F	P	+28V CONTACT #1
4526	3/3	/NA				+28V CONTACT #2
4527 *	3/2R	/NA	P	F	P	+28V CONTACT #2
4528	3/3	/NA				+28V CONTACT #3
4529 *	3/2R	/NA	P	F	P	+28V CONTACT #3
4530	3/3	/NA				+28V CONTACT #4
4531 *	3/2R	/NA	P	F	P	+28V CONTACT #4

(\*) Potential Critical Items.

# KU-BAND DEPLOY ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
4532 *	3/2R	/NA	P	F	P	+28V CONTACT #1
4533 *	3/1R	/NA	P	F	P	+28V CONTACT #1
4534 *	3/2R	/NA	P	F	P	+28V CONTACT #2
4535 *	3/1R	/NA	P	F	P	+28V CONTACT #2
4536 *	3/2R	/NA	P	F	P	+28V CONTACT #3
4537 *	3/1R	/NA	P	F	P	+28V CONTACT #3
4538 *	3/2R	/NA	P	F	P	+28V CONTACT #4
4539 *	3/1R	/NA	P	F	P	+28V CONTACT #4
4540	3/3	/NA				TALKBACK
4541	3/3	/NA				TALKBACK
4542	3/3	/NA				TALKBACK
4543 *	3/2R	/NA	P	F	P	AND GATE #1
4544 *	3/1R	/NA	P	F	P	AND GATE #1
4545 *	3/2R	/NA	P	F	P	AND GATE #2
4546 *	3/1R	/NA	P	F	P	AND GATE #2
4547 *	3/1R	/NA	P	F	P	AND GATE #1
4548 *	3/2R	/NA	P	F	P	AND GATE #1
4549 *	3/1R	/NA	P	F	P	AND GATE #2
4550 *	3/2R	/NA	P	F	P	AND GATE #2
4551 *	3/2R	/NA	P	F	P	AMP #1
4552 *	3/1R	/NA	P	F	P	AMP #1
4553 *	3/2R	/NA	P	F	P	AMP #2
4554 *	3/1R	/NA	P	F	P	AMP #2
4555 *	3/1R	/NA	P	F	P	AMP #1
4556 *	3/2R	/NA	P	F	P	AMP #1
4557 *	3/1R	/NA	P	F	P	AMP #2
4558 *	3/2R	/NA	P	F	P	AMP #2
4559 *	3/2R	/NA	P	F	P	K14
4560 *	3/1R	/NA	P	F	P	K14
4561 *	3/2R	/NA	P	F	P	K68
4562 *	3/1R	/NA	P	F	P	K68
4563 *	3/1R	/NA	P	F	P	K72
4564 *	3/2R	/NA	P	F	P	K72
4565 *	3/1R	/NA	P	F	P	K70
4566 *	3/2R	/NA	P	F	P	K70
4567 *	3/1R	/NA	P	F	P	STOW MICROSWITCH #1
4568	3/3	/NA				STOW MICROSWITCH #1
4569 *	3/2R	/NA	P	F	P	DEPLOY MICROSWITCH #1
4570	3/3	/NA				DEPLOY MICROSWITCH #1
4571 *	3/2R	/NA	P	F	P	AND GATE #1
4572 *	3/1R	/NA	P	F	P	AND GATE #1
4573 *	3/2R	/NA	P	F	P	AND GATE #2
4574 *	3/1R	/NA	P	F	P	AND GATE #2
4575 *	3/1R	/NA	P	F	P	AND GATE #1
4576 *	3/2R	/NA	P	F	P	AND GATE #1

(\*) Potential Critical Items.

# KU-BAND DEPLOY ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
4577 *	3/1R	/NA	P	F	P	AND GATE #2
4578 *	3/2R	/NA	P	F	P	AND GATE #2
4579 *	3/2R	/NA	P	F	P	AMP #1
4580 *	3/1R	/NA	P	F	P	AMP #1
4581 *	3/2R	/NA	P	F	P	AMP #2
4582 *	3/1R	/NA	P	F	P	AMP #2
4583 *	3/1R	/NA	P	F	P	AMP #1
4584 *	3/2R	/NA	P	F	P	AMP #1
4585 *	3/1R	/NA	P	F	P	AMP #2
4586 *	3/2R	/NA	P	F	P	AMP #2
4587 *	3/2R	/NA	P	F	P	K25
4588 *	3/1R	/NA	P	F	P	K25
4589 *	3/2R	/NA	P	F	P	K2
4591 *	3/1R	/NA	P	F	P	K2
4592 *	3/1R	/NA	P	F	P	K27
4593 *	3/2R	/NA	P	F	P	K27
4594 *	3/1R	/NA	P	F	P	K37
4595 *	3/2R	/NA	P	F	P	K37
4596 *	3/1R	/NA	P	F	P	STOW MICROSWITCH #2
4597	3/3	/NA				STOW MICROSWITCH #2
4598 *	3/2R	/NA	P	F	P	DEPLOY MICROSWITCH #2
4599	3/3	/NA				DEPLOY MICROSWITCH #2
4600 *	3/1R	/NA	P	F	P	+28V CONTACT #1
4601 *	3/1R	/NA	P	F	P	+28V CONTACT #1
4602 *	3/1R	/NA	P	F	P	+28V CONTACT #2
4603 *	3/1R	/NA	P	F	P	+28V CONTACT #2
4604 *	3/1R	/NA	P	F	P	+28V CONTACT #3
4605 *	3/1R	/NA	P	F	P	+28V CONTACT #3
4606 *	3/1R	/NA	P	F	P	+28V CONTACT #4
4607 *	3/1R	/NA	P	F	P	+28V CONTACT #4
4608	3/3	/NA				+28V CONTACT #1
4609	3/3	/NA				+28V CONTACT #1
4610	3/3	/NA				+28V CONTACT #2
4611	3/3	/NA				+28V CONTACT #2
4612	3/3	/NA				+28V CONTACT #3
4613	3/3	/NA				+28V CONTACT #3
4614	3/3	/NA				+28V CONTACT #4
4615	3/3	/NA				+28V CONTACT #4
4616 *	3/1R	/NA	P	F	P	+28V CONTACT #1
4617 *	3/1R	/NA	P	F	P	+28V CONTACT #1
4618 *	3/1R	/NA	P	F	P	+28V CONTACT #2
4619 *	3/1R	/NA	P	F	P	+28V CONTACT #2
4620	3/3	/NA				+28V CONTACT #1
4621	3/3	/NA				+28V CONTACT #1
4622	3/3	/NA				+28V CONTACT #2

(\*) Potential Critical Items.



# KU-BAND DEPLOY ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
4623	3/3	/NA				+28V CONTACT #2
4624 *	3/1R	/NA	P	F	P	AND GATE #1
4625 *	3/1R	/NA	P	F	P	AND GATE #1
4626 *	3/1R	/NA	P	F	P	AND GATE #2
4627 *	3/1R	/NA	P	F	P	AND GATE #2
4628 *	3/1R	/NA	P	F	P	40 MS TIME DELAY
4629 *	3/1R	/NA	P	F	P	40 MS TIME DELAY
4630 *	3/1R	/NA	P	F	P	AMP #1
4631 *	3/1R	/NA	P	F	P	AMP #1
4632 *	3/1R	/NA	P	F	P	AND GATE #3
4633 *	3/1R	/NA	P	F	P	AND GATE #3
4634 *	3/1R	/NA	P	F	P	4 SECOND TIME DELAY
4635 *	3/1R	/NA	P	F	P	4 SECOND TIME DELAY
4636 *	3/1R	/NA	P	F	P	AMP #3
4637 *	3/1R	/NA	P	F	P	AMP #3
4638 *	3/1R	/NA	P	F	P	EXPLOSIVE INITIATOR
4639 *	3/1R	/NA	P	F	P	EXPLOSIVE INITIATOR
4640 *	3/1R	/NA	P	F	P	EXPLOSIVE INITIATOR
4641 *	3/1R	/NA	P	F	P	EXPLOSIVE INITIATOR
4642 *	3/1R	/NA	P	F	P	AND GATE #1
4643 *	3/1R	/NA	P	F	P	AND GATE #1
4644 *	3/1R	/NA	P	F	P	AND GATE #2
4645 *	3/1R	/NA	P	F	P	AND GATE #2
4646 *	3/1R	/NA	P	F	P	40 MS TIME DELAY
4647 *	3/1R	/NA	P	F	P	40 MS TIME DELAY
4648 *	3/1R	/NA	P	F	P	AMP #1
4649 *	3/1R	/NA	P	F	P	AMP #1
4650 *	3/1R	/NA	P	F	P	AND GATE #3
4651 *	3/1R	/NA	P	F	P	AND GATE #3
4652 *	3/1R	/NA	P	F	P	4 SECOND TIME DELAY
4653 *	3/1R	/NA	P	F	P	4 SECOND TIME DELAY
4654 *	3/1R	/NA	P	F	P	AMP #3
4655 *	3/1R	/NA	P	F	P	AMP #3
4656 *	3/1R	/NA	P	F	P	EXPLOSIVE INITIATOR
4657 *	3/1R	/NA	P	F	P	EXPLOSIVE INITIATOR
4658 *	3/1R	/NA	P	F	P	EXPLOSIVE INITIATOR
4659 *	3/1R	/NA	P	F	P	EXPLOSIVE INITIATOR
4660 *	3/1R	/NA	P	F	P	AMP #2
4661 *	3/1R	/NA	P	F	P	AMP #2
4662 *	3/1R	/NA	P	F	P	AMP #2
4663 *	3/1R	/NA	P	F	P	AMP #2
4664 *	3/1R	/NA	P	F	P	CONVERTER
4665 *	3/1R	/NA	P	F	P	CONVERTER
4666 *	3/1R	/NA	P	F	P	INVERTED AND GATE
4667 *	3/1R	/NA	P	F	P	INVERTED AND GATE

(\*) Potential Critical Items.

# KU-BAND DEPLOY ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT	ABORT	SCREENS			
	H/F	H/F	A	B	C	
4668 *	3/1R	/NA	P	F	P	CAPACITOR BANK
4669 *	3/1R	/NA	P	F	P	CAPACITOR BANK
4670 *	3/1R	/NA	P	F	P	AND GATE
4671 *	3/1R	/NA	P	F	P	AND GATE
4672	3/3	/NA				AMP
4673	3/3	/NA				AMP
4674 *	3/1R	/NA	P	F	P	TEST LOGIC
4675 *	3/1R	/NA	P	F	P	TEST LOGIC
4676 *	3/1R	/NA	P	F	P	CONVERTER
4677 *	3/1R	/NA	P	F	P	CONVERTER
4678 *	3/1R	/NA	P	F	P	INVERTED AND GATE
4679 *	3/1R	/NA	P	F	P	INVERTED AND GATE
4680 *	3/1R	/NA	P	F	P	CAPACITOR BANK
4681 *	3/1R	/NA	P	F	P	CAPACITOR BANK
4682 *	3/1R	/NA	P	F	P	AND GATE
4683 *	3/1R	/NA	P	F	P	AND GATE
4684	3/3	/NA				AMP
4685	3/3	/NA				AMP
4686 *	3/1R	/NA	P	F	P	TEST LOGIC
4687 *	3/1R	/NA	P	F	P	TEST LOGIC

(\*) Potential Critical Items.

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 1/1  
MDAC ID: 4101 ABORT: 3/3

ITEM: GUILLOTINE/PRESSURE CARTRIDGE  
FAILURE MODE: FAILS MID-TRAVEL, FAILS TO CLOSE, INTERNAL  
LEAKAGE, PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE (RUPTURE),  
PARTIAL OUTPUT

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) JETTISON ASSEMBLY
- 5) GUILLOTINE/PRESSURE CARTRIDGE
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	1/1	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: KU-BAND ANTENNA  
PART NUMBER: SKD26100105-201/301

CAUSES: CONTAMINATION, PIECE-PART FAILURE, STRUCTURAL FAILURE,  
JAMMED

EFFECTS/RATIONALE:

UNABLE TO PROPERLY SECURE/EJECT THE ANTENNA. ANTENNA WOULD BE  
SECURED BY ONLY THE CABLE OR PARTIAL CABLE. EVA WOULD BE  
REQUIRED TO SEVER THE CABLE AND EJECT THE DEPLOYMENT MECHANISM OR  
PROPERLY SECURE THE DEPLOYMENT MECHANISM.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 2/2  
MDAC ID: 4102 ABORT: 3/3

ITEM: GUILLOTINE/PRESSURE CARTRIDGE  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) JETTISON ASSEMBLY
- 5) GUILLOTINE/PRESSURE CARTRIDGE
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	2/2	RTLS:	3/3	
LIFTOFF:	2/2	TAL:	3/3	
ONORBIT:	2/2	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: KU-BAND ANTENNA  
PART NUMBER: SKD26100105-201/301

CAUSES: ERRONEOUS INPUT, MECHANICAL SHOCK, TEMPERATURE,  
ACCELERATION, ELECTROMAGNETIC FIELDS, VIBRATION, INADVERTENT  
OPERATION/ACTIVATION

EFFECTS/RATIONALE:

LOSS OF KU-BAND COMMUNICATION SYSTEM. DEPENDING ON MISSION  
REQUIREMENTS, COULD MEAN LOSS OF MISSION.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 1/1  
MDAC ID: 4103 ABORT: 3/3

ITEM: NUT/BREECH  
FAILURE MODE: INTERNAL/EXTERNAL LEAKAGE, PHYSICAL  
BINDING/JAMMING, RESTRICTED FLOW, STRUCTURAL FAILURE (RUPTURE),  
PARTIAL OUTPUT

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) JETTISON ASSEMBLY
- 5) NUT/BREECH
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	1/1	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: KU-BAND ANTENNA  
PART NUMBER: SKD26100105-501/601

CAUSES: PIECE-PART FAILURE, STRUCTURAL FAILURE, JAMMED

EFFECTS/RATIONALE:  
UNABLE TO PROPERLY SECURE/EJECT THE ANTENNA. EVA WORK AROUND  
WOULD BE REQUIRED TO PROPERLY SECURE/EJECT THE DEPLOYMENT  
MECHANISM.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 1/1  
MDAC ID: 4104 ABORT: 1/1

ITEM: NUT/BREECH  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) JETTISON ASSEMBLY
- 5) NUT/BREECH
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/2	RTLS:	1/1
LIFTOFF:	1/1	TAL:	1/1
ONORBIT:	1/1	AOA:	1/1
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: KU-BAND ANTENNA  
PART NUMBER: SKD26100105-601/501

CAUSES: ERRONEOUS INPUT, MECHANICAL SHOCK, TEMPERATURE,  
ACCELERATION, ELECTROMAGNETIC FIELDS, VIBRATION, INADVERTENT  
OPERATION/ACTIVATION

EFFECTS/RATIONALE:

UNABLE TO PROPERLY SECURE/EJECT THE ANTENNA. ANTENNA WOULD BE  
SECURED BY ONLY THE CABLE OR PARTIAL CABLE. EVA WOULD BE  
REQUIRED TO SEVER THE CABLE AND EJECT THE DEPLOYMENT MECHANISM OR  
PROPERLY SECURE THE DEPLOYMENT MECHANISM.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 2/1R  
MDAC ID: 4105 ABORT: 3/3

ITEM: INPUT/OUTPUT SHAFT - HOUSING  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE  
(RUPTURE)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) DEPLOYMENT ASSEMBLY
- 5) INPUT/OUTPUT SHAFT-HOUSING
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2R	AOA:	3/3
DEORBIT:	2/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: KU-BAND ANTENNA  
PART NUMBER: TBD

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE,  
THERMAL SHOCK, ACCCELERATION, VIBRATION

EFFECTS/RATIONALE:

UNABLE TO DEPLOY/STOW THE ANTENNA. INHIBIT KU-BAND COMMUNICATION  
SYSTEM POSSIBLY PLBD CLOSURE.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 2/1R  
MDAC ID: 4106 ABORT: 3/3

ITEM: INPUT/OUTPUT SHAFT - HOUSING  
FAILURE MODE: FAILS TO START/STOP AS COMMANDED & ROTATES FREELY  
IN DEPLOYMENT PLANE.

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) DEPLOYMENT ASSEMBLY
- 5) INPUT/OUTPUT SHAFT-HOUSING
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2R	AOA:	3/3
DEORBIT:	2/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: KU-BAND ANTENNA  
PART NUMBER: TBD

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE,  
THERMAL SHOCK, ACCCELERATION, VIBRATION

EFFECTS/RATIONALE:

UNABLE TO DEPLOY/STOW THE ANTENNA. INHIBIT KU-BAND COMMUNICATION  
SYSTEM POSSIBLY PLBD CLOSURE.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 3/1R  
MDAC ID: 4107 ABORT: 3/3

ITEM: STOW LIMIT SWITCHES (S1 & 2) ACTUATOR  
FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE  
OPERATION, SHORTED

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) DEPLOYMENT ASSEMBLY
- 5) STOW LIMIT SWITCHES (S1 & S)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: DEPLOYMENT ASSEMBLY  
PART NUMBER: S 1 & 2, V070-544903

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE,  
TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT  
OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES ANTENNA STOWED WHEN IT MAY BE DEPLOYED. IF THE  
ANTENNA IS DEPLOYED, STOW CAPABILITY WOULD BE INHIBITED.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 3/3  
MDAC ID: 4108 ABORT: 3/3

ITEM: STOW LIMIT SWITCHES (S1 & 2) ACTUATOR  
FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, PREMATURE  
OPERATION, OPEN (ELECTRICAL)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) DEPLOYMENT ASSEMBLY
- 5) STOW LIMIT SWITCHES (S1 & S)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DEPLOYMENT ASSEMBLY  
PART NUMBER: S 1 & 2, V070-544903

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE,  
TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT  
OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES ANTENNA NOT STOWED WHEN IT MAY BE PROPERLY  
SECURED. MOTORS WOULD CONTINUE TO TURN UNTIL OFF COMMAND IS  
TRANSMITTED. CREW WOULD BE REQUIRED TO DETERMINE CONFIGURATION.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 2/1R  
MDAC ID: 4109 ABORT: 3/3

ITEM: DEPLOY LIMIT SWITCHES (S5 & 6)  
FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE  
OPERATION, SHORTED

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) DEPLOYMENT ASSEMBLY
- 5) DEPLOY LIMIT SWITCHES (S5 & 6)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: DEPLOYMENT ASSEMBLY  
PART NUMBER: S5 & S6, V070-54903

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE,  
TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT  
OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES ANTENNA DEPLOYED WHEN IT MAY BE STOWED. IF THE  
ANTENNA IS STOWED, DEPLOYMENT CAPABILITY WOULD BE INHIBITED. IF  
THE ANTENNA IS PARTIALLY DEPLOYED AND KU POWER ON POSSIBLE  
ORBITER IMPACT WITH ANTENNA INITIALIZATION INITIATION.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 2/1R  
MDAC ID: 4110 ABORT: 3/3

ITEM: DEPLOY LIMIT SWITCHES (S5 & 6)  
FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, PREMATURE  
OPERATION, OPEN (ELECTRICAL)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) DEPLOYMENT ASSEMBLY
- 5) DEPLOY LIMIT SWITCHES (S5 & 6)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	2/1R	AOA: 3/3
DEORBIT:	3/3	ATO: 3/3
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: DEPLOYMENT ASSEMBLY  
PART NUMBER: S5 & S6, V070-54903

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE,  
TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT  
OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES ANTENNA NOT DEPLOYED WHEN IT MAY BE DEPLOYED.  
MOTORS WOULD CONTINUE TO TURN UNTIL OFF COMMAND IS TRANSMITTED.  
TRANSMIT SCAN ENABLE WOULD BE INHIBITED AND KU-BAND COMMUNICATION  
LOST.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 2/1R  
MDAC ID: 4111 ABORT: 3/3

ITEM: GEAR TRAIN ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,  
FRACTURE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) ACTUATOR ASSEMBLY
- 5) GEAR TRAIN ASSEMBLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	2/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: KU-BAND ANTENNA  
PART NUMBER: MC287-0026-0002

CAUSES: CONTAMINATION, PIECE-PART FAILURE, STRUCTURAL FAILURE,  
JAMMED, FRACTURE

EFFECTS/RATIONALE:  
UNABLE TO STOW/DEPLOY ANTENNA.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

REPORT DATE 11/25/87 C-321

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87  
SUBSYSTEM: MECH/KBD  
MDAC ID: 4112

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 3/3

ITEM: GEAR TRAIN ASSEMBLY  
FAILURE MODE: FAILS TO REMAIN IN POSITION, FREELY ROTATES

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) ACTUATOR ASSEMBLY
- 5) GEAR TRAIN ASSEMBLY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/3	AOA:	3/3	
DEORBIT:	2/1R	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: KU-BAND ANTENNA  
PART NUMBER: MC287-0026-0002

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, STRUCTURAL  
FAILURE, VIBRATION, OVERLOAD

EFFECTS/RATIONALE:  
UNABLE TO STOW OR DEPLOY ANTENNA.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

REPORT DATE 11/25/87

C-322

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD FLIGHT: 3/3  
MDAC ID: 4113 ABORT: 3/3

ITEM: ALL ITEMS NOT SHOWN ON MDAC ID 4101 - 4112  
FAILURE MODE: ALL FAILURE MODES

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) ALL REMAINING PARTS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	3/3		RTLS:	3/3
LIFTOFF:	3/3		TAL:	3/3
ONORBIT:	3/3		AOA:	3/3
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: KU-BAND ANTENNA  
PART NUMBER: ALL PARTS NOT SHOWN ON MDAC ID 4101 - 4112

CAUSES: ALL CAUSES

EFFECTS/RATIONALE:

FAILURE OF ALL PARTS NOT SHOWN ON MDAC ID 4101 - 4112 WILL HAVE  
NO EFFECT ON MISSION, VEHICLE OR CREW.

REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2,  
SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

REPORT DATE 11/25/87

C-323

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4500

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) ON POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/3	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/3  
MDAC ID: 4501 ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) ON POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/3		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4502

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) ON POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4503

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) ON POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4504

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) ON POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4505

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) ON POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4506

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) ON POSITION
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4507

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) ON POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4508

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) OFF POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/2R	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OFP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4509

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) OFF POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OFP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4510

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) OFF POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OFP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF THE ANTENNA.

REFERENCES:

REPORT DATE 11/25/87

C-334

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4511

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) OFF POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OFP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4512

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) OFF POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/2R	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OFP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4513

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) OFF POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OFP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4514

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) OFF POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OFP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMAND  
STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4515

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) OFF POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DS.OFP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4516

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.DP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4517

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) DEPLOY POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/2R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.DP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4518

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/1R	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.DP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4519

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.DP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4520

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.DP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4521

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.DP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4522

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) DEPLOY POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/1R	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.DP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4523

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: 7

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) DEPLOY POSITION
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.DP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4524

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) GROUND POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.GP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4525

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) GROUND POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.GP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4526

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) GROUND POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/3	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.GP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4527

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) GROUND POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.GP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4528

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) GROUND POSITION
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.GP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4529

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) GROUND POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.GP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4530

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) GROUND POSITION
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.GP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4531

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) GROUND POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/2R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.GP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4532

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) STOW POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.SP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4533

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.SP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R  
MDAC ID: 4534 ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) STOW POSITION
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.SP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4535

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.SP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4536

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.SP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4537

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) STOW POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/1R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.SP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4538

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) STOW POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/2R	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.SP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4539

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) STOW POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.SP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4540

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: TALKBACK  
FAILURE MODE: FAILS TO DEPLOY

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/3	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.TB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
TALKBACK MAY NOT SHOW CORRECT STATUS.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4541

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: TALKBACK  
FAILURE MODE: FAILS TO BARBERPOLE

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/3		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.TB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
TALKBACK MAY NOT SHOW CORRECT STATUS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4542

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: TALKBACK  
FAILURE MODE: FAILS TO STOW

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: DISPLAY AND CONTROL PANEL R13A2  
PART NUMBER: KBS.DC.SW.DGS.TB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
TALKBACK MAY NOT SHOW CORRECT STATUS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4543

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) STOW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/2R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.MC2.STW.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4544

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) STOW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.STW.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4545

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) STOW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.MC2.STW.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED  
STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4546

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) STOW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.STW.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4547

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/1R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.EP.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4548

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.EP.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4549

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/1R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.MC2.EP.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4550

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.EP.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4551

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) STOW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.STW.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4552

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) STOW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.STW.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4553

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) STOW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/2R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.STW.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4554

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) STOW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.STW.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4555

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/1R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.STW.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4556

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.STW.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4557

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.MC2.STW.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4558

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.STW.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4559

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: K14  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.RLY.K14

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4560

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: K14  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.RLY.K14

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4561

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: K68  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.RLY.K68

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4562

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: K68  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.RLY.K68

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4563

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: K72  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.RLY.K72

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4564

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: K72  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.RLY.K72

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4565

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: K70  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.RLY.K70

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4566

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: K70  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC2
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/2R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC2.RLY.K70

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4567

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: STOW MICROSWITCH #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/1R	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.SMS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF ONE MOTOR DURING STOW OPERATIONS. SUBSEQUENT FAILURES  
COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4568

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: STOW MICROSWITCH #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.SMS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4569

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: DEPLOY MICROSWITCH #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DMS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF ONE MOTOR DURING DEPLOY OPERATIONS. SUBSEQUENT FAILURES  
COULD PREVENT DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4570

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: DEPLOY MICROSWITCH #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DMS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4571

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) STOW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.STW.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4572

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) STOW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.STW.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4573

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) STOW
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.STW.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4574

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) STOW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.STW.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4575

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.DEP.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4576

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS: /
LIFTOFF:	/	TAL: /
ONORBIT:	3/2R	AOA: /
DEORBIT:	/	ATO: /
LANDING/SAFING:	/	

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.DEP.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4577

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/1R	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.DEP.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4578

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.DEP.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4579

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) STOW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.STW.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4580

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) STOW
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.STW.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4581

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) STOW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.STW.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4582

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) STOW
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.STW.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4583

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.DEP.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4584

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.DEP.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4585

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.DEP.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4586

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) DEPLOY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.DEP.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4587

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: K25  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.RLY.K25

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4588

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: K25  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.RLY.K25

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4589

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: K2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.RLY.K2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4591

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: K2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.RLY.K2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4592

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: K27  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.RLY.K27

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4593

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: K27  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.RLY.K27

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

REPORT DATE 11/25/87

C-416

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4594

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: K37  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.RLY.K37

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4595

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: K37  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) MMC4
- 5) RELAY
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.MC4.RLY.K37

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT  
DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4596

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: STOW MICROSWITCH #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.SMS.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF ONE MOTOR DURING STOW OPERATIONS. SUBSEQUENT FAILURES  
COULD PREVENT STOWAGE OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4597

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: STOW MICROSWITCH #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.SMS.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R  
MDAC ID: 4598 ABORT: /

ITEM: DEPLOY MICROSWITCH #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/2R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DMS.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF ONE MOTOR DURING DEPLOY OPERATIONS. SUBSEQUENT FAILURES  
COULD PREVENT DEPLOYMENT OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4599

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: DEPLOY MICROSWITCH #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DMS.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4600

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) ARM POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.AP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4601

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) ARM POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.AP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4602

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) ARM POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/1R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.AP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4603

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) ARM POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.AP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4604

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) ARM POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.DC.SW.AS.AP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4605

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) ARM POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.DC.SW.AS.AP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4606

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) ARM POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/1R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.AP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4607

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) ARM POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.AP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4608

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) SAFE POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.SP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4609

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) SAFE POSITION
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.SP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/3  
MDAC ID: 4610 ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) SAFE POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/3		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER: KBS.DC.SW.AS.SP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4611

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) SAFE POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.SP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4612

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) SAFE POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/3		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER: KBS.DC.SW.AS.SP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4613

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) SAFE POSITION
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS:
LIFTOFF:	/	TAL:
ONORBIT:	3/3	AOA:
DEORBIT:	/	ATO:
LANDING/SAFING:	/	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.SP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4614

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) SAFE POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER: KBS.DC.SW.AS.SP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4615

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #4  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) ARM/SAFE
- 7) SAFE POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DC.SW.AS.SP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4616

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) JETTISON/SAFE
- 7) JETTISON POSITION
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/1R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DC.SW.JS.JP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4617

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) JETTISON/SAFE
- 7) JETTISON POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DC.SW.JS.JP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4618

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) JETTISON/SAFE
- 7) JETTISON POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DC.SW.JS.JP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4619

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) JETTISON/SAFE
- 7) JETTISON POSITION
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/1R	AOA:	/	
DEORBIT:	/	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.DC.SW.JS.JP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4620

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) JETTISON/SAFE
- 7) SAFE POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DC.SW.JS.SP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4621

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) JETTISON/SAFE
- 7) SAFE POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DC.SW.JS.SP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/3  
MDAC ID: 4622 ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) JETTISON/SAFE
- 7) SAFE POSITION
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DC.SW.JS.SP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4623

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: +28V CONTACT #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) JETTISON/SAFE
- 7) SAFE POSITION
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.DC.SW.JS.SP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4624

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE  
ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4625

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4626

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE  
ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4627

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4628

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: 40 MS TIME DELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.MTD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE  
ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4629

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: 40 MS TIME DELAY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.MTD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4630

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE  
ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4631

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4632

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.AG3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4633

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.AG3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4634

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: 4 SECOND TIME DELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.STD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4635

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: 4 SECOND TIME DELAY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.STD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4636

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.AM3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE  
ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4637

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.AM3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4638

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: EXPLOSIVE INITIATOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) GUILLLOTINE PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.GP.EI

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4639

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: EXPLOSIVE INITIATOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) GUILLOTINE PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.GP.EI

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4640

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: EXPLOSIVE INITIATOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) NUT PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.NP.EI

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE  
ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4641

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: EXPLOSIVE INITIATOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) NUT PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.NP.EI

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4642

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4643

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4644

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4645

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.AG2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4646

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: 40 MS TIME DELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.MTD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4647

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: 40 MS TIME DELAY  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.MTD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4648

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4649

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #1  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.AM1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4650

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.AG3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4651

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.AG3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4652

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: 4 SECOND TIME DELAY  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.STD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4653

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: 4 SECOND TIME DELAY  
FAILURE MODE: FAILS ON

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.STD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4654

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #3  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.AM3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4655

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #3  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.AM3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R  
MDAC ID: 4656 ABORT: /

ITEM: EXPLOSIVE INITIATOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) GUILLOTINE PIC
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/1R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.GP.EI

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4657

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: EXPLOSIVE INITIATOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) GUILLOTINE PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.GP.EI

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4658

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: EXPLOSIVE INITIATOR  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) NUT PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.NP.EI

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4659

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: EXPLOSIVE INITIATOR  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) NUT PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.NP.EI

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4660

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4661

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4662

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4663

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AMP #2  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.AM2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4664

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: CONVERTER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.PIC.CON

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4665

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: CONVERTER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.PIC.CON

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4666

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.PIC.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4667

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/1R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.PIC.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4668

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: CAPACITOR BANK  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.PIC.CB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4669

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: CAPACITOR BANK  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.PIC.CB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4670

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC1.PIC.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4671

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.PIC.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4672

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER: KBS.LC1.PIC.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4673

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:

PART NUMBER: KBS.LC1.PIC.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4674

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: TEST LOGIC  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.PIC.TL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4675

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: TEST LOGIC  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA1
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC1.PIC.TL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4676

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: CONVERTER  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.PIC.CON

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4677

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: CONVERTER  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.PIC.CON

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4678

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.PIC.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE  
ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4679

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: INVERTED AND GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.PIC.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R  
MDAC ID: 4680 ABORT: /

ITEM: CAPACITOR BANK  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.PIC.CB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4681

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: CAPACITOR BANK  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.PIC.CB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4682

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.PIC.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE  
ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4683

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: AND GATE  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.PIC.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON  
OF THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4684

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: AMP  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER: KBS.LC3.PIC.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4685

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: AMP  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/3		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:  
PART NUMBER: KBS.LC3.PIC.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4686

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: TEST LOGIC  
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER: KBS.LC3.PIC.TL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/21/87  
SUBSYSTEM: MECH/KBD/EPD&C  
MDAC ID: 4687

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: TEST LOGIC  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND SUBSYSTEM
- 3) ELECTRICAL
- 4) LCA3
- 5) PIC
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:

PART NUMBER: KBS.LC3.PIC.TL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

REFERENCES:

C.5

PAYOAD BAY DOORS ANALYSIS WORKSHEETS

# PAYLOAD BAY DOORS ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
5101 *	2/1R	2/1R	P	P	P	CENTERLINE/BULKHEAD LATCH MTR
5102 *	2/1R	2/1R	P	F	P	CENTERLINE/BULKHEAD LATCH MTR
5103	3/3	3/3				CENTERLINE/BULKHEAD LATCH MTR
5104 *	2/1R	2/1R	P	F	P	CENTERLINE/BULKHEAD LATCH MTR
5105	3/3	3/3				CENTERLINE/BULKHEAD LATCH MTR
5106 *	2/1R	2/1R	P	F	P	CENTERLINE/BULKHEAD LATCH MTR
5107 *	1/1	1/1				CENTERLINE/BULKHEAD LATCH GANG
5108 *	2/1R	2/1R	P	F	P	CENTERLINE/BULKHEAD LATCH GANG
5109 *	1/1	1/1				CENTERLINE/BULKHEAD LATCH GANG
5110 *	1/1	1/1				CL/BLKHD TORQUE LIMITER
5111 *	1/1	1/1				CL/BLKHD TORQUE LIMITER
5112 *	1/1	1/1				CL/BLKHD TORQUE LIMITER
5113 *	1/1	1/1				CENTERLINE/BULKHEAD GEARBOX
5114 *	1/1	1/1				CENTERLINE/BULKHEAD GEARBOX
5115 *	1/1	1/1				CENTERLINE/BULKHEAD GEARBOX
5116	3/3	3/3				CL/BLKHD SWITCH OPEN LIMIT
5117	3/2R	3/2R	P	P	P	CL/BLKHD SWITCH OPEN LIMIT
5118	3/3	/NA				CL/BLKHD CLOSED LIMIT SWITCH
5119 *	2/1R	/NA	P	P	P	CL/BLKHD CLOSED LIMIT SWITCH
5120 *	1/1	1/1				CLLG TORQUE SHAFT/COUPLINGS
5121 *	1/1	1/1				CLLG TORQUE SHAFT/COUPLINGS
5122 *	1/1	1/1				CENTERLINE LATCH ASSEMBLY
5123 *	2/1R	2/1R	P	N	P	CENTERLINE LATCH ASSEMBLY
5124	3/3	/NA				CENTERLINE LATCH ASSEMBLY
5125 *	2/1R	2/1R	P	N	P	CL LATCH ROLLER ASSEMBLY
5126	3/3	3/3				CL LATCH ROLLER ASSEMBLY
5127 *	2/1R	/NA	P	N	F	PBD SHEAR FITTING ROLLER
5128 *	2/1R	2/1R	P	N	P	PBD SHEAR FITTING ROLLER
5129 *	2/1R	2/1R	P	N	P	PBD SHEAR FITTING ROLLER
5130 *	2/1R	2/1R	P	N	F	PBD SHEAR FITTING CLAW
5131 *	2/1R	2/1R	P	N	P	PBD SHEAR FITTING CLAW
5132 *	2/1R	2/1R	P	N	P	PBD SHEAR FITTING CLAW
5133 *	2/1R	2/1R	P	N	P	BULKHEAD LATCH GANG BELLCRANK
5134 *	2/1R	2/1R	P	N	P	BULKHEAD LATCH GANG BELLCRANK
5135 *	2/1R	2/1R	P	N	P	BULKHEAD PUSH-PULL ROD
5136 *	2/1R	2/1R	P	N	P	BULKHEAD PUSH-PULL ROD
5137 *	2/1R	2/1R	P	N	P	BULKHEAD LATCH LINKAGE
5138 *	2/1R	2/1R	P	N	P	BULKHEAD LATCH LINKAGE
5139 *	2/1R	/NA	P	N	P	BULKHEAD LATCH LINKAGE
5140 *	2/1R	2/1R	P	N	P	BULKHEAD ROLLER ASSEMBLY
5141	3/3	3/3				BULKHEAD ROLLER ASSEMBLY
5142	3/3	/NA				BULKHEAD DOOR CLOSED SWITCH
5143 *	2/1R	/NA	P	P	P	BULKHEAD DOOR CLOSED SWITCH
5144	3/3	/NA				BULKHEAD READY-TO-LATCH SWITCH
5145 *	2/1R	/NA	P	P	P	BULKHEAD READY-TO-LATCH SWITCH

(\*) Potential Critical Items.

# PAYLOAD BAY DOORS ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
5146 *	2/1R	2/1R	P	P	P	PAYLOAD BAY DOOR DRIVE MOTOR
5147 *	2/1R	2/1R	P	F	P	PAYLOAD BAY DOOR DRIVE CLUTCH
5148	3/3	3/3				PAYLOAD BAY DOOR DRIVE CLUTCH
5149 *	2/1R	2/1R	P	F	P	PAYLOAD BAY DOOR DRIVE BRAKE
5150	3/3	3/3				PAYLOAD BAY DOOR DRIVE BRAKE
5151 *	2/1R	2/1R	P	F	P	PBD CLUTCH/BRAKE DISC
5152 *	1/1	1/1				PBD DRIVE DIFFERENTIAL
5153 *	2/2	2/2				PBD DRIVE DIFFERENTIAL
5154 *	1/1	1/1				PBD DRIVE DIFFERENTIAL
5155 *	1/1	1/1				PAYLOAD BAY DOOR DRIVE GEARBOX
5156 *	1/1	1/1				PAYLOAD BAY DOOR DRIVE GEARBOX
5157 *	2/2	2/2				PAYLOAD BAY DOOR DRIVE GEARBOX
5158 *	1/1	1/1				PAYLOAD BAY DOOR DRIVE TORQUE
5159 *	2/1R	2/1R	P	N	F	PBD DRIVE SUPPORT ASSEMBLY
5160 *	1/1	1/1				PBD DRIVE SUPPORT ASSEMBLY
5161 *	1/1	1/1				PBD DRIVE SUPPORT ASSEMBLY
5162	3/1R	3/1R	P	N	P	PBD DRIVE ROTARY ACT/TL
5163 *	1/1	1/1				PBD DRIVE ROTARY ACT/TL
5164 *	1/1	1/1				PBD DRIVE ROTARY ACT/TL
5165 *	1/1	1/1				PBD DRIVE ROTARY ACT/TL
5166 *	1/1	1/1				PBD DRIVE ROTARY ACT/TL
5167 *	2/1R	2/1R	P	N	P	PBD DRIVE ROTARY ACT/TL
5168 *	1/1	1/1				PAYLOAI BAY DOOR DRIVE LINKAGE
5169	3/1R	3/1R	P	N	P	PAYLOAD BAY DOOR DRIVE LINKAGE
5170	3/3	3/3				PBD OPEN LIMIT SWITCH
5171	3/2R	3/2R	P	P	P	PBD OPEN LIMIT SWITCH
5172	3/3	/NA				PBD 88 DEG LIMIT SWITCH
5173	3/3	/NA				PBD 88 DEG LIMIT SWITCH
5174 *	1/1	1/1				PAYLOAD BAY DOOR
5175 *	1/1	1/1				PAYLOAD BAY DOOR
5176 *	2/1R	2/1R	P	N	P	PBD ALIGNMENT ROLLER
5177	3/1R	3/1R	P	N	P	PBD ALIGNMENT ROLLER GUIDE
5178	3/3	3/3				PAYLOAD BAY DOOR PASSIVE STOP
5179	3/1R	3/1R	P	N	P	PBD SHEAR/FLOATING HINGE
5501 *	2/1R	2/1R	P	F	P	CONTROL BUS 1.2K RESISTOR
5502 *	2/1R	2/1R	P	F	P	CONTROL BUS 1.2K RESISTOR
5503 *	2/1R	2/1R	P	F	P	CONTROL BUS 1.2K RESISTOR
5504 *	2/1R	2/1R	P	P	P	PBD CONTROL SWITCH
5505 *	2/1R	2/1R	P	P	P	FUSE, 1A
5506 *	2/1R	2/1R	P	P	P	PBD MECHANICAL POWER SWITCH
5507 *	2/1R	2/1R	P	F	P	MAIN DC BUS RELAY
5508	3/3	3/3				MAIN DC BUS RELAY
5509	3/3	3/3				DIODE
5510	3/3	3/3				DIODE
5511 *	2/1R	2/1R	P	F	P	SWITCH RESISTOR, 1.2K 2W

(\*) Potential Critical Items.

# PAYLOAD BAY DOORS ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
5512	3/3	3/3				SWITCH RESISTOR, 1.2K 2W
5513 *	2/1R	2/1R	P	F	P	SWITCH RESISTOR, 1.2K 2W
5514 *	2/1R	2/1R	P	F	P	PAYLOAD BAY DOORS AC BUS RELAY
5515 *	2/1R	2/1R	P	F	P	PAYLOAD BAY DOORS AC BUS RELAY
5516 *	2/1R	2/1R	P	N	P	MCA AC POWER CIRCUIT BREAKER
5517 *	2/1R	2/1R	P	P	P	MCA RELAY LOGIC POWER SWITCH
5518	3/3	3/3				MCA RELAY LOGIC POWER SWITCH
5519 *	2/1R	2/1R	P	F	P	REMOTE POWER CONTROLLER

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 (\*) Potential Critical Items.

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5101 ABORT: 2/1R

ITEM: CENTERLINE/BULKHEAD LATCH MOTOR  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH MOTOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS  
OF INPUT

EFFECTS/RATIONALE:

THE LOSS OF A MOTOR WOULD RESULT IN LATCHING/UNLATCHING TAKING A  
LONGER TIME. THE LOSS OF THE REDUNDANT MOTOR ON A CENTERLINE  
LATCH GANG IS MORE SERIOUS THAN FOR THE BULKHEAD LATCH GANG. THE  
FAILURE TO LATCH A BULKHEAD GANG (4 LATCHES) STILL ALLOWS  
FOR A SAFE ENTRY. ONLY 2 CENTERLINE LATCHES, EXCEPT FOR THE 15-  
16 PAIR, CAN BE UNLATCHED FOR A SAFE ENTRY. FAILURE TO UNLATCH A  
GANG WOULD PREVENT PBD OPENING AND CAUSES A LOSS OF MISSION.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5102 ABORT: 2/1R

ITEM: CENTERLINE/BULKHEAD LATCH MOTOR CLUTCH  
FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH MOTOR CLUTCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF CLUTCH TO ENGAGE WHEN POWER APPLIED WOULD PREVENT THE  
MOTOR SHAFT FROM ROTATING. REDUNDANT MOTOR WOULD COMPLETE  
LATCH/UNLATCHING BUT AT A SLOWER RATE. NO EFFECT ON CREW/VEHICLE  
OR MISSION.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5103 ABORT: 3/3

ITEM: CENTERLINE/BULKHEAD LATCH MOTOR CLUTCH  
FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH MOTOR CLUTCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF THE CLUTCH TO DISENGAGE WOULD ALLOW THE MOTOR SHAFT TO ROTATE INSTEAD OF BEING STOPPED. SINCE THIS OCCURS AFTER LATCH/UNLATCHING THIS HAS MINIMAL IMPACT. THE FAILURE WOULD BE IMPORTANT IF THE ASSOCIATED MOTOR ALSO WERE TO FAIL. THIS WOULD CAUSE A LOSS OF OUTPUT FROM THE DIFFERENTIAL AND THE LOSS OF A LATCH GANG.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5104 ABORT: 2/1R

ITEM: CENTERLINE/BULKHEAD LATCH MOTOR BRAKE  
FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH MOTOR BRAKE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF BRAKE TO DISENGAGE WHEN POWER IS APPLIED WOULD PREVENT  
THE MOTOR SHAFT FROM ROTATING. REDUNDANT MOTOR WOULD COMPLETE  
LATCH/UNLATCHING BUT AT A SLOWER RATE. NO EFFECT ON CREW/VEHICLE  
OR MISSION.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5105 ABORT: 3/3

ITEM: CENTERLINE/BULKHEAD LATCH MOTOR BRAKE  
FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH MOTOR BRAKE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

EFFECT OF BRAKE FAILING TO ENGAGE WOULD BE THAT THE MOTOR SHAFT WOULD STILL BE ABLE TO ROTATE INSTEAD OF BEING LOCKED, SINCE THIS OCCURS AFTER LATCHING/UNLATCHING THIS HAS MINIMAL IMPACT. THIS FAILURE WOULD BE IMPORTANT IF THE ASSOCIATED MOTOR ALSO WERE TO FAIL WHICH WOULD THEN RESULT IN THE REDUNDANT MOTOR BACKDRIVING THE FAILED ONE WHICH WOULD CAUSE A LOSS OF OUTPUT FROM THE DIFFERENTIAL AND LOSS OF A LATCH GANG.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87  
SUBSYSTEM: MECH/PBD  
MDAC ID: 5106

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: CENTERLINE/BULKHEAD LATCH MOTOR CLUTCH/BRAKE DISC  
FAILURE MODE: SLIPS

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH MOTOR
- 4) CLUTCH/BRAKE DISC
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, TEMPERATURE

EFFECTS/RATIONALE:

SLIPPING OF THE CLUTCH/BRAKE DISC WOULD REDUCE THE INPUT TO THE DIFFERENTIAL AND THE RATE OF LATCH GANG OPEN/CLOSING. REDUNDANT MOTOR WOULD SUPPLY LATCH OPERATION POWER. LOSS OF MOTOR ALONG WITH CLUTCH/BRAKE FAILURE WOULD PERMIT BACKDRIVING BY REMAINING MOTOR, NO OUTPUT FROM THE DIFFERENTIAL AND POSSIBLE LOSS OF MISSION OR CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250, V070-594260, MC287-0040, MC287-0039

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5107 ABORT: 1/1

ITEM: CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	1/1	AOA:	/	
DEORBIT:	1/1	ATO:	1/1	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS  
OF INPUT, VIBRATION

EFFECTS/RATIONALE:

THE EFFECT OF THIS FAILURE WOULD BE THE INABILITY TO  
LATCH/UNLATCH A CENTER/BULKHEAD LATCH GANG. IF UNABLE TO UNLATCH  
A GANG WHEN OPENING THE PBD THEN A LOSS OF MISSION RESULTS. IF  
UNABLE TO LATCH A CENTERLINE LATCH GANG THEN AN UNSAFE CONDITION  
WOULD  
EXIST ON ENTRY. AN EVA CAPABILITY EXISTS TO SECURE TWO FAILED  
LATCHES. BULKHEAD LATCH GANG CAN FAIL OPEN AND LEAVE SUFFICIENT  
STRUCTURAL INTEGRITY FOR A SAFE ENTRY.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87 C-521

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5108 ABORT: 2/1R

ITEM: CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL  
FAILURE MODE: PARTIAL OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, PARTIAL  
INPUT

EFFECTS/RATIONALE:

IF OUTPUT OF TORQUE FROM THE DIFFERENTIAL WAS LOW ENOUGH THE SINGLE MOTOR DRIVE TIME LIMIT WOULD BE HIT. THE COMBINATION OF EXCESSIVE TIME AND NO VISUAL CUE OF WHETHER THE CENTERLINE LATCH HOOKS ARE CLEAR OF THE ROLLERS WOULD END PBD OPENING CAUSING A LOSS OF MISSION. IF UNABLE TO CLOSE CENTERLINE LATCH GANG THE POSSIBILITY EXISTS OF LOSS OF CREW/VEHICLE. AN EVA COULD BE PERFORMED TO SECURE 2 OF THE 4 LATCHES IN A GANG WHICH WOULD ALLOW A SAFE ENTRY. A SAFE ENTRY CAN BE MADE WITH A BULKHEAD GANG FAILED OPEN. VISUAL CUES AS TO THE STATE OF THE BULKHEAD LATCHES ARE AVAILABLE.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039, FLIGHT RULES SECTION 10-  
MMACS

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5109 ABORT: 1/1

ITEM: CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE EFFECT OF THIS FAILURE WOULD BE THE INABILITY TO  
LATCH/UNLATCH A CENTER/BULKHEAD LATCH GANG. IF UNABLE TO UNLATCH  
A GANG WHEN OPENING THE PBD THEN A LOSS OF MISSION RESULTS. IF  
UNABLE TO LATCH A CENTERLINE LATCH GANG THEN AN UNSAFE CONDITION  
WOULD  
EXIST ON ENTRY. AN EVA CAPABILITY EXISTS TO SECURE TWO FAILED  
LATCHES. BULKHEAD LATCH GANG CAN FAIL OPEN AND LEAVE SUFFICIENT  
STRUCTURAL INTEGRITY FOR A SAFE ENTRY.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-523

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5110 ABORT: 1/1

ITEM: CENTERLINE/BULKHEAD TORQUE LIMITER  
FAILURE MODE: FAILS TO OPERATE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD TORQUE LIMITER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART  
FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF TORQUE LIMITER TO SLIP DUE TO EXCESSIVE TORQUE COULD  
CAUSE COMPONENTS TO BREAK OR BE DAMAGED. POSSIBLE LOSS OF  
MISSION IF UNABLE TO OPEN PBD AND LOSS OF CREW/VEHICLE IF UNABLE  
TO CLOSE PBD BECAUSE OF JAMMED OR BROKEN COMPONENTS. EVA  
CAPABILITY EXISTS TO CLOSE PBDS. CENTERLINE LATCH GANG MUST BE  
LATCHED FOR A SAFE ENTRY, BULKHEAD GANG CAN FAIL OPEN FOR A SAFE  
ENTRY.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-524



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5111 ABORT: 1/1

ITEM: CENTERLINE/BULKHEAD TORQUE LIMITER  
FAILURE MODE: FAILS OUT OF TOLERANCE, SLIPS AT LESS THAN MINIMUM  
ALLOWABLE LIMIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD TORQUE LIMITER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

TORQUE LIMITER SLIPPING AT LESS THAN THE MINIMUM SPECIFIED LIMIT  
COULD CAUSE A LATCH GANG TO NOT LATCH/UNLATCH. THE FAILURE TO  
LATCH A BULKHEAD LATCH GANG STILL ALLOWS MARGIN FOR A SAFE ENTRY.  
THE FAILURE OF A CENTERLINE LATCH GANG LOWERS THE  
STRUCTURAL INTEGRITY OF THE ORBITER LEADING TO A POSSIBLE LOSS OF  
CREW/VEHICLE. EVA CAN BE PERFORMED TO SECURE A FAILED LATCH.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-525

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87  
SUBSYSTEM: MECH/PBD  
MDAC ID: 5112

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 1/1  
ABORT: 1/1

ITEM: CENTERLINE/BULKHEAD TORQUE LIMITER  
FAILURE MODE: FAILS OUT OF TOLERANCE, DOES NOT SLIP AT MAXIMUM  
ALLOWABLE LIMIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD TORQUE LIMITER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	1/1	AOA:	/	
DEORBIT:	1/1	ATO:	1/1	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

POSSIBLE DAMAGE TO LATCH LINKAGES, TORQUE SHAFT OR POWER DRIVE  
UNIT COULD OCCUR IF TORQUE LIMITER DOES NOT SLIP WHEN A JAM  
OCCURS. FAILURE OF A CENTERLINE LATCH TORQUE SHAFT COULD FAIL  
THE ENTIRE GANG IN THE UNLATCHED POSITION WHICH IS UNACCEPTABLE  
FOR  
ENTRY. POSSIBLE LOSS OF CREW/VEHICLE IF ANY DAMAGE SEVERE  
ENOUGH.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-526

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5113 ABORT: 1/1

ITEM: CENTERLINE/BULKHEAD GEARBOX  
FAILURE MODE: FAILS TO TRANSFER MOTOR OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD GEARBOX
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	
		ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF GEARBOX WOULD CAUSE THE LOSS OF A LATCH GANG. LOSS OF  
MISSION WOULD OCCUR IF THIS HAPPENED WHEN OPENING PBD AND LATCHES  
WERE NOT CLEAR OF ROLLERS. POSSIBLE LOSS OF CREW/VEHICLE IF  
CENTERLINE LATCH GANG COULD NOT BE LATCHED AND CREW DOES NOT  
DETECT THIS. THERE IS AN EVA PROCEDURE TO SECURE FAILED LATCHES.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-527

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5114 ABORT: 1/1

ITEM: CENTERLINE/BULKHEAD GEARBOX  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD GEARBOX
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

FAILURE WOULD CAUSE THE LOSS OF A LATCH GANG. LOSS OF MISSION  
WOULD OCCUR IF THIS HAPPENED WHEN OPENING PBD AND LATCHES WERE  
NOT CLEAR OF ROLLERS. POSSIBLE LOSS OF CREW/VEHICLE IF  
CENTERLINE LATCH GANG COULD NOT BE LATCHED. EVA PROCEDURE EXISTS  
TO SECURE FAILED LATCHES.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-528

C-7

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5115 ABORT: 1/1

ITEM: CENTERLINE/BULKHEAD GEARBOX  
FAILURE MODE: PARTIAL OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD GEARBOX
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

INSUFFICIENT OUTPUT WOULD NOT FULLY LATCH/UNLATCH A GANG. SINGLE  
MOTOR DRIVE TIME WOULD BE REACHED BEFORE FULL LATCH TRAVEL  
COMPLETED. VISUAL CUES ARE AVAILABLE FOR THE BULKHEAD LATCHES  
BUT NOT THE CENTERLINE ONES. FAILURE TO LATCH A CENTERLINE GANG  
COULD RESULT IN THE LOSS OF CREW/VEHICLE. FAILURE TO UNLATCH A  
GANG WOULD CAUSE THE LOSS OF MISSION.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-529

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5116 ABORT: 3/3

ITEM: CENTERLINE/BULKHEAD OPEN LIMIT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD OPEN LIMIT SWICH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: MC452-0123

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

EFFECT WOULD BE THAT THE MOTOR WOULD CONTINUE TO RUN. WITH TWO  
MOTORS OPERATING THE LATCHES WOULD REACHED THE OPEN POSITION,  
TORQUE LIMITERS WOULD SLIP WHEN LINKAGES JAM. SINGLE MOTOR DRIVE  
TIME WOULD BE REACHED. NO EFFECT ON MISSION OR CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-530

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/2R  
MDAC ID: 5117 ABORT: 3/2R

ITEM: CENTERLINE/BULKHEAD OPEN LIMIT SWITCH  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD OPEN LIMIT SWICH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/2R		AOA:	/
DEORBIT:	/		ATO:	3/2R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: M452-0123

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION, SHORTED

EFFECTS/RATIONALE:

LIMIT SWITCH PREMATURELY GOING TO THE OPEN POSITION WOULD SHUT  
OFF A MOTOR. REDUNDANT MOTOR WOULD CONTINUE OPENING THE LATCH  
GANG AT A REDUCED RATE. FAILURE OF BOTH SWITCHES WOULD PREVENT  
PBD OPENING CAUSING LOSS OF MISSION. NO EFFECT ON CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-531

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5118 ABORT: /

ITEM: CENTERLINE/BULKHEAD CLOSED LIMIT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD CLOSED LIMIT SWICH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	/	AOA:	/
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS

PART NUMBER: M452-0123

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

EFFECT WOULD BE THAT THE MOTOR WOULD CONTINUE TO RUN. WITH TWO  
MOTORS OPERATING THE LATCHES WOULD REACH THE CLOSED POSITION,  
TORQUE LIMITERS WOULD SLIP WHEN LINKAGES JAM. SINGLE MOTOR DRIVE  
TIME WOULD BE REACHED. NO EFFECT ON MISSION OR CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-532



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5119 ABORT: /

ITEM: CENTERLINE/BULKHEAD CLOSED LIMIT SWITCH  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD CLOSED LIMIT SWICH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	/	AOA:	/
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD  
BAY BULKHEADS  
PART NUMBER: M452-0123

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION, SHORTED

EFFECTS/RATIONALE:

LIMIT SWITCH PREMATURELY GOING TO THE CLOSED POSITION WOULD SHUT  
OFF A MOTOR. REDUNDANT MOTOR WOULD CONTINUE CLOSING THE LATCH  
GANG AT A REDUCED RATE. FAILURE OF BOTH SWITCHES WOULD PREVENT  
PBD CLOSURE CAUSING A POSSIBLE LOSS OF CREW/VEHICLE. AN EVA  
CAPABILITY IS ON HAND TO MANUALLY SECURE A FAILED LATCH.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,  
V070-594260, MC287-0040, MC287-0039

REPORT DATE 11/25/87

C-533

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5120 ABORT: 1/1

ITEM: CENTERLINE LATCH GANG TORQUE SHAFT/COUPLINGS  
FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH GANG TORQUE SHAFT/COUPLINGS
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	1/1	AOA:	/	
DEORBIT:	1/1	ATO:	1/1	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD  
PART NUMBER: V070-594345-001 TO -009, V070-594325-001, V070-594326-001, V070-594347-001, V070-594350-001, V070-59354-001 & -002, +MISC.

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION,  
STRIPPED CROWN SPINLINE

EFFECTS/RATIONALE:

BROKEN TORQUE SHAFT/COUPLING WOULD PREVENT A LATCH OR TWO LATCHES FROM LATCH/UNLATCHING. WHEN OPENING PBD THIS WOULD PREVENT OPENING AND CAUSE A LOSS OF MISSION. FAILURE AFTER LATCH HOOK CLEARS ROLLER OR WHEN LATCHING PBD CLOSED COULD CAUSE A POSSIBLE LOSS OF CREW/VEHICLE. LATCH PAIR 15-16 MUST BE CLOSED TO HAVE A FACTOR OF SAFETY GREATER THAN 1. STRUCTURAL INTEGRITY OF VEHICLE IS LOWERED WITH A LATCH PAIR FAILED.

REFERENCES: V070-594300, V070-594360, MC287-0040

REPORT DATE 11/25/87

C-534

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5121 ABORT: 1/1

ITEM: CENTERLINE LATCH GANG TORQUE SHAFT/COUPLINGS  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH GANG TORQUE SHAFT/COUPLINGS
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD

PART NUMBER: V070-594345-001 TO -009, V070-594325-001, V070-594326-001, V070-594347-001, V070-594350-001, V070-59354-001 & -002, +MISC.

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, VIBRATION, SEIZED BUSHING, PBD WARPED

EFFECTS/RATIONALE:

BINDING/JAMMING TORQUE SHAFT/COUPLING WOULD PREVENT A LATCH OR TWO LATCHES FROM LATCH/UNLATCHING. WHEN OPENING PBD THIS WOULD PREVENT OPENING AND CAUSE A LOSS OF MISSION. FAILURE AFTER LATCH HOOK CLEARS ROLLER OR WHEN LATCHING PBD CLOSED COULD CAUSE A POSSIBLE LOSS OF CREW/VEHICLE. LATCH PAIR 15-16 MUST BE CLOSED TO HAVE A FACTOR OF SAFETY GREATER THAN 1. STRUCTURAL INTEGRITY OF VEHICLE IS LOWERED WITH A LATCH PAIR FAILED.

REFERENCES: V070-594300, V070-594360, MC287-0040

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5122 ABORT: 1/1

ITEM: CENTERLINE LATCH ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH GANG LATCH ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD  
PART NUMBER: V070-594306-001, V070-594307-001 & -002, V070-594341-001, V070-594357-002

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, PBD WARPED

EFFECTS/RATIONALE:

BINDING/JAMMING OF LATCH ASSEMBLY BEFORE LATCH OPENED WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF OCCURS AFTER LATCH HOOK CLEARED ROLLER OR WHEN CLOSING PBD THE TORQUE LIMITER WOULD SLIP DUE TO THE JAM. THIS WOULD ALSO PREVENT THE OTHER 3 LATCHES FROM MOVING. POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, MC287-0040

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5123 ABORT: 2/1R

ITEM: CENTERLINE LATCH ASSEMBLY  
FAILURE MODE: BROKEN COMPONENT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH GANG LATCH ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: STARBOARD PBD  
PART NUMBER: V070-594306-001, V070-594307-001 & -002, V070-594341-001, V070-594357-002

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, MATERIAL FATIGUE

EFFECTS/RATIONALE:

BROKEN LINK OR BELLCRANK WOULD PREVENT TORQUE SHAFT ROTATION FROM MOVING THE LATCH HOOK TO THE OPEN POSITION POSSIBLY PREVENTING PBD OPENING CAUSING A LOSS OF MISSION. BROKEN LINK, BELLCRANK OR LATCH WOULD PREVENT CLOSING OF A LATCH. SAFE ENTRY CAN BE MADE WITH A SINGLE LATCH NOT ENGAGED, SOME LOSS OF STRUCTURAL INTEGRITY. NO EFFECT ON CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, MC287-0040

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87  
SUBSYSTEM: MECH/PBD  
MDAC ID: 5124

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: CENTERLINE LATCH ASSEMBLY  
FAILURE MODE: LATCH HOOK FAILS TO ENGAGE ROLLER

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH GANG LATCH ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	/	AOA:	/	
DEORBIT:	3/3	ATO:	/	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD PBD  
PART NUMBER: V070-594306-001, V070-594307-001 & -002, V070-594341-001, V070-594357-002

CAUSES: TEMPERATURE, MISRIGGED

EFFECTS/RATIONALE:

LATCH HOOK FAILING TO ENGAGE ROLLER WHEN CLOSING PBD WOULD CAUSE LOSS OF THAT LATCH. SAFE ENTRY CAN BE MADE WITH A SINGLE LATCH NOT ENGAGED, SOME LOSS OF STRUCTURAL INTEGRITY. NO EFFECT ON CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, MC287-0040

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5125 ABORT: 2/1R

ITEM: CENTERLINE LATCH ROLLER ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH ROLLER ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: PORT PBD  
PART NUMBER: V070-594330-004, -005, -006

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE

EFFECTS/RATIONALE:

BINDING/JAMMING OF THE ROLLER ASSEMBLY WHEN OPENING A LATCH  
CAUSES TORQUE LIMITER TO ENGAGE AND A LOSS OF MISSION WHEN PBD  
CANNOT BE OPENED. SAME SITUATION OCCURRING WHEN CLOSING COULD  
PREVENT A LATCH GANG FROM ENGAGING AND POSSIBLE LOSS OF  
CREW/VEHICLE. EVA CAPABILITY EXISTS TO SECURE FAILED LATCHES.

REFERENCES: V070-594300, V070-594360, MC287-0040

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5126 ABORT: 3/3

ITEM: CENTERLINE LATCH ROLLER ASSEMBLY  
FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH ROLLER ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PORT PBD  
PART NUMBER: V070-594330-004, -005, -006

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

BROKEN ROLLER ASSEMBLY PREVENTS HOOK ENGAGING ROLLER. RESULT IS DECREASED VEHICLE STRUCTURAL INTEGRITY DUE TO A LATCH MISSING BUT SAFE ENTRY IS POSSIBLE. NO EFFECT ON MISSION OR CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, MC287-0040



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5127 ABORT: /

ITEM: PBD SHEAR FITTING ROLLER  
FAILURE MODE: FAILS TO ENGAGE CLAW

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PBD SHEAR FITTING ROLLER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	/	AOA:	/
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ F ]

LOCATION: PORT PBD  
PART NUMBER: V070-594302-001, -002, -003

CAUSES: PIECE-PART FAILURE, TEMPERATURE, MISADJUSTED

EFFECTS/RATIONALE:

FAILURE OF SHEAR FITTING ROLLER TO ENGAGE CLAW COULD PREVENT BPD CLOSURE. IF PBD CAN BE CLOSED IT WOULD DEGRADE STRUCTURAL INTEGRITY OF VEHICLE. POSSIBLE LOSS OF CREW/VEHICLE IF MORE THAN ONE FAILS TO ENGAGE.

REFERENCES: V070-594300, V070-594360, MC287-0040

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5128 ABORT: 2/1R

ITEM: PBD SHEAR FITTING ROLLER  
FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PBD SHEAR FITTING ROLLER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: PORT PBD  
PART NUMBER: V070-594302-001, -002, -003

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
TEMPERATURE

EFFECTS/RATIONALE:

BROKEN ROLLER WOULD DEGRADE VEHICLE STRUCTURAL INTEGRITY. SHEAR  
LOAD CARRIED BY THIS FITTING WOULD BE CARRIED BY REMAINING  
FITTINGS. POSSIBLE LOSS OF CREW/VEHICLE IN THE EVENT OF MULTIPLE  
FAILURES.

REFERENCES: V070-594300, V070-594360, MC287-0040

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5129 ABORT: 2/1R

ITEM: PBD SHEAR FITTING ROLLER  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PBD SHEAR FITTING ROLLER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: PORT PBD  
PART NUMBER: V070-594302-001, -002, -003

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

BINDING/JAMMING ROLLER PREVENTS MOVEMENT OF ROLLER OUT OR INTO CLAW. LOSS OF MISSION IF PBD CANNOT BE OPENED. LOSS OF CREW/VEHICLE IF ROLLER WILL NOT ENGAGE CLAW AND STOPS DOOR CLOSURE.

REFERENCES: V070-594300, V070-594360, MC287-0040

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5130 ABORT: 2/1R

ITEM: PBD SHEAR FITTING CLAW  
FAILURE MODE: FAILS TO ENGAGE ROLLER

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PBD SHEAR FITTING CLAW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ F ]

LOCATION: STARBOARD PBD  
PART NUMBER: V070-59375-001, V070-594376-001, V070-594378-001

CAUSES: PIECE-PART FAILURE, TEMPERATURE, MISADJUSTED

EFFECTS/RATIONALE:

FAILURE OF SHEAR FITTING CLAW TO ENGAGE ROLLER COULD PREVENT PBD CLOSURE. IF PBD CAN BE CLOSED IT WOULD DEGRADE STRUCTURAL INTEGRITY OF VEHICLE. POSSIBLE LOSS OF CREW/VEHICLE IF MORE THAN ONE FAILS.

REFERENCES: V070-594300, V070-594360, MC287-0040

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5131 ABORT: 2/1R

ITEM: PBD SHEAR FITTING CLAW  
FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PBD SHEAR FITTING CLAW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: STARBOARD PBD  
PART NUMBER: V070-59375-001, V070-594376-001, V070-594378-001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
TEMPERATURE

EFFECTS/RATIONALE:

BROKEN CLAW WOULD DEGRADE VEHICLE STRUCTURAL INTEGRITY. SHEAR  
LOAD CARRIED BY THIS FITTING WOULD CARRIED BY REMAINING FITTINGS.  
POSSIBLE LOSS OF CREW/VEHICLE IN THE EVENT OF MULTIPLE FAILURES.

REFERENCES: V070-594300, V070-594360, MC287-0040

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5132 ABORT: 2/1R

ITEM: PBD SHEAR FITTING CLAW  
FAILURE MODE: BENT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PBD SHEAR FITTING CLAW
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: STARBOARD PBD  
PART NUMBER: V070-59375-001, V070-594376-001, V070-594378-001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BENT CLAW WOULD PREVENT PBD OPENING/CLOSING. IF ROLLER CANNOT FOLLOW NOMINAL TRAJECTORY AS PBD OPENS A JAM WOULD OCCUR RESULTING IN A LOSS OF MISSION. IF ROLLER CANNOT SEAT IN CLAW, PBD MAY BE PREVENTED FROM CLOSING. POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, MC287-0040

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5133 ABORT: 2/1R

ITEM: BULKHEAD LATCH GANG BELLCRANK LINKAGE  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD LATCH BELLCRANK LINKAGE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594163-001 & -002, V070-594165-001 & -002,  
V070594167-001, V070-594223-001, V070-594263-005 & -006, V070-  
594265-005 & -006, V070-594267-001 & -002, AND MISC.

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BINDING/JAMMING OF BELLCRANK OR LINK WOULD PREVENT PBD OPENING  
CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR  
ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE  
COULD CAUSE THE LOSS OF 1, 2 OR 3 LATCHES DEPENDING ON THE  
LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO  
GANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE  
GANG FAILED.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5134 ABORT: 2/1R

ITEM: BULKHEAD LATCH GANG BELLCRANK LINKAGE  
FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD LATCH BELLCRANK LINKAGE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594163-001 & -002, V070-594165-001 & -002,  
V070594167-001, V070-594223-001, V070-594263-005 & -006, V070-  
594265-005 & -006, V070-594267-001 & -002, AND MISC.

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN BELLCRANK, LINK OR ASSOCIATED HARDWARE WOULD PREVENT PBD  
OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER  
LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS  
POSSIBLE. FAILURE COULD CAUSE THE LOSS OF 1, 2 OR 3 LATCHES  
DEPENDENT  
ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS  
TWO GANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE  
GANG FAILED.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5135 ABORT: 2/1R

ITEM: BULKHEAD PUSH-PULL ROD  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD PUSH-PULL ROD
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594220, AND MISC.

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BINDING/JAMMING OF PUSHROD WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE COULD CAUSE THE LOSS OF 1, 2 OR 3 LATCHES DEPENDING ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO GANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE GANG FAILED.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5136 ABORT: 2/1R

ITEM: BULKHEAD PUSH-PULL ROD  
FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD PUSH-PULL ROD
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594220, AND MISC.

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN PUSHROD OR ASSOCIATED HARDWARE WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE COULD CAUSE THE LOSS OF 1, 2 OR 3 LATCHES DEPENDING ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO GANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE GANG FAILED.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5137 ABORT: 2/1R

ITEM: BULKHEAD LATCH LINKAGE  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD LATCH LINKAGE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594280, V070-594276 THRU V070-594279, V070-594281 THRU V070-594284, V070-594314, V070-594315, V070-594319, V070-594316, V070-594317, V070-594320

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, CONTAMINATION

EFFECTS/RATIONALE:

BINDING/JAMMING OF LATCHING BELLCRANK, LINK OR HOOK WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE COULD CAUSE LOSS OF 1, 2, 3 OR 4 LATCHES DEPENDING ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO GANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE GANG FAILED.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5138 ABORT: 2/1R

ITEM: BULKHEAD LATCH LINKAGE  
FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD LATCH LINKAGE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594280, V070-594276 THRU V070-594279, V070-594281 THRU V070-594284, V070-594314, V070-594315, V070-594319, V070-594316, V070-594317, V070-594320

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN BELLCRANK, LINK OR HOOK WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE COULD CAUSE LOSS OF 1, 2, 3 OR 4 LATCHES DEPENDING ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO BANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE GANG FAILED.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5139 ABORT: /

ITEM: BULKHEAD LATCH LINKAGE  
FAILURE MODE: FAILS TO LATCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD LATCH LINKAGE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	/		AOA:	/
DEORBIT:	2/1R		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594280, V070-594276 THRU V070-594279, V070-594281 THRU V070-594284, V070-594314, V070-594315, V070-594319, V070-594316, V070-594317, V070-594320

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, MISRIGGED

EFFECTS/RATIONALE:

FAILURE TO LATCH REDUCES STRUCTURAL INTEGRITY OF THE VEHICLE. AN ENTIRE BULKHEAD LATCH GANG CAN FAIL BUT STILL ALLOW A SAFE ENTRY. NO EFFECT ON CREW/VEHICLE.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5140 ABORT: 2/1R

ITEM: BULKHEAD ROLLER ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD ROLLER ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594180, V070-594280

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
MISADJUSTED

EFFECTS/RATIONALE:

BINDING/JAMMING OF A BULKHEAD COULD POSSIBLY PREVENT PBD  
OPEN/CLOSING. FAILURE COULD PREVENT A SECURE LATCH OF HOOK WITH  
ROLLER WHEN FORCE CAUSES TORQUE LIMITER TO SLIP. SAFE ENTRY CAN  
BE MADE WITH A GANG FAILED. NO EFFECT ON CREW/VEHICLE.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5141 ABORT: 3/3

ITEM: BULKHEAD ROLLER ASSEMBLY  
FAILURE MODE: BROKEN FROM BULKHEAD

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD ROLLER ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594180, V070-594280

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
TEMPERATURE

EFFECTS/RATIONALE:

THE LOSS OF A ROLLER ASSEMBLY WOULD INCREASE THE LOAD ON THE  
REMAINING ROLLERS. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5142 ABORT: /

ITEM: BULKHEAD DOOR CLOSED SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD DOOR CLOSED SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	/	AOA:	/
DEORBIT:	3/3	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594222

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT

EFFECTS/RATIONALE:

MOTOR WOULD CONTINUE TO RUN TILL SINGLE MOTOR DRIVE TIME LIMIT  
REACHED. TORQUE LIMITER WOULD BEGIN SLIPPING WHEN DOOR REACHED  
CLOSED POSITION. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5143 ABORT: /

ITEM: BULKHEAD DOOR CLOSED SWITCH  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD DOOR CLOSED SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	/	AOA:	/
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594222

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

DOOR CLOSED SWITCH PREMATURELY GOING TO THE CLOSED POSITION WOULD SHUT OFF A MOTOR. REDUNDANT MOTOR WOULD CONTINUE CLOSING THE PBD AT A REDUCED RATE. FAILURE OF BOTH SWITCHES WOULD PREVENT COMPLETE PBD CLOSURE AND LATCHING WITH POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5144 ABORT: /

ITEM: BULKHEAD READY-TO-LATCH SWITCH MODULE  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD READY-TO-LATCH SWITCH MODULE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	/		AOA:	/
DEORBIT:	3/3		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594222

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, MISADJUSTED

EFFECTS/RATIONALE:

FAILURE OF READY-TO-LATCH SWITCH MODULE WOULD PREVENT A BULKHEAD LATCH GANG FROM ENGAGING THE BULKHEAD ROLLERS AND CLOSING THE PBD. THIS FAILURE WOULD CAUSE A CRT MESSAGE TO ALERT THE CREW. MANUAL PROCEDURE CAN THEN CLOSE PBD. A SAFE ENTRY IS WITH A BULKHEAD GANG UNLATCHED. NO EFFECT ON CREW/VEHICLE.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5145 ABORT: /

ITEM: BULKHEAD READY-TO-LATCH SWITCH MODULE  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD READY-TO-LATCH SWITCH MODULE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	/	AOA:	/
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD  
PART NUMBER: V070-594222

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,  
VIBRATION, INADVERTENT OPERATION, MISADJUSTED

EFFECTS/RATIONALE:

PREMATURE SWITCHING BY THE READY-TO-LATCH MODULE WOULD CAUSE A  
PREMATURE ATTEMPT TO LATCH. COULD POSSIBLY INTERFERE WITH  
CLOSING PBD. IF THERE IS NO INTERFERENCE THE LOSS OF A LATCH  
GANG REDUCES VEHICLE STRUCTURAL INTEGRITY BUT A SAFE ENTRY CAN  
BE ACCOMPLISHED.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5146 ABORT: 2/1R

ITEM: PAYLOAD BAY DOOR DRIVE MOTOR  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE MOTOR
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT

EFFECTS/RATIONALE:

THE LOSS A PBD DRIVE MOTOR CAUSES THE OPEN/CLOSING OF THE PBD AT A REDUCED RATE BY THE REDUNDANT MOTOR. LOSS OF MISSION WOULD ONLY HAPPEN IF BOTH MOTORS FAIL WHEN OPENING THE PBD. POSSIBLE LOSS OF CREW/VEHICLE UPON FAILURE OF BOTH MOTORS AND UNABLE TO PERFORM EVA CLOSING OF PBD.

REFERENCES: V070-594125

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5147 ABORT: 2/1R

ITEM: PAYLOAD BAY DOOR DRIVE CLUTCH  
FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE CLUTCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF CLUTCH TO ENGAGE WHEN POWER IS APPLIED WOULD PREVENT  
THE MOTOR SHAFT FROM ROTATING. REDUNDANT MOTOR WOULD COMPLETE  
OPEN/CLOSING OF PBD BUT AT A SLOWER RATE.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5148 ABORT: 3/3

ITEM: PAYLOAD BAY DOOR DRIVE CLUTCH  
FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE CLUTCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF THE CLUTCH TO DISENGAGE WOULD ALLOW THE MOTOR SHAFT TO ROTATE INSTEAD OF BEING STOPPED. SINCE THIS OCCURS AFTER OPEN/CLOSING OF PBD THIS HAS MINIMAL IMPACT. THE FAILURE WOULD BE IMPORTANT IF THE ASSOCIATED MOTOR ALSO WERE TO FAIL. THIS WOULD CAUSE A LOSS OF OUTPUT FROM THE DIFFERENTIAL AND PBD OPEN/CLOSE.

REFERENCES: V070-594125

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5149 ABORT: 2/1R

ITEM: PAYLOAD BAY DOOR DRIVE BRAKE  
FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE BRAKE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF BRAKE TO DISENGAGE WHEN POWER IS APPLIED WOULD PREVENT  
THE MOTOR SHAFT FROM ROTATING. REDUNDANT MOTOR WOULD COMPLETE  
OPEN/CLOSING OF THE PBD BUT AT A SLOWER RATE.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87  
SUBSYSTEM: MECH/PBD  
MDAC ID: 5150

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: PAYLOAD BAY DOOR DRIVE BRAKE  
FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE BRAKE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	/	RTLS:
LIFTOFF:	/	TAL:
ONORBIT:	3/3	AOA:
DEORBIT:	3/3	ATO:
LANDING/SAFING:	/	3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF BRAKE TO ENGAGE WOULD ALLOW THE MOTOR SHAFT TO ROTATE INSTEAD OF BEING LOCKED. SINCE THIS OCCURS AFTER OPEN/CLOSING OF PBD THIS HAS MINIMAL IMPACT. THE FAILURE WOULD BE IMPORTANT IF THE ASSOCIATED MOTOR ALSO WERE TO FAIL. THIS WOULD CAUSE A LOSS OF OUTPUT FROM THE DIFFERENTIAL AND PBD OPEN/CLOSE.

REFERENCES: V070-594125



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5151 ABORT: 2/1R

ITEM: PAYLOAD BAY DOOR DRIVE CLUTCH/BRAKE DISC  
FAILURE MODE: SLIPS

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE CLUTCH/BRAKE DISC
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, TEMPERATURE

EFFECTS/RATIONALE:

SLIPPING OF THE CLUTCH/BRAKE DISC WOULD REDUCE THE INPUT TO THE DIFFERENTIAL AND THE RATE OF PBD OPEN/CLOSING. REDUNDANT MOTOR WOULD SUPPLY OPEN/CLOSING POWER. LOSS OF MOTOR ALONG WITH CLUTCH/BRAKE DISC SLIPPAGE WOULD PERMIT BACKDRIVING BY REMAINING MOTOR, NO OUTPUT FROM THE DIFFERENTIAL AND POSSIBLE LOSS OF MISSION OR CREW/VEHICLE.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5152 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE DIFFERENTIAL  
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE DIFFERENTIAL
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS  
OF INPUT, VIBRATION

EFFECTS/RATIONALE:

UNABLE TO OPEN/CLOSE PBD. IF UNABLE TO OPEN THE PBD THEN A LOSS  
OF MISSION RESULTS. IF UNABLE TO CLOSE THE PBD THEN A SAFE ENTRY  
CANNOT BE MADE. AN EVA, THE UNLIKE REDUNDANCY, WOULD BE  
NECESSARY TO CLOSE THE PBD.

REFERENCES: V070-594125

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/2  
MDAC ID: 5153 ABORT: 2/2

ITEM: PAYLOAD BAY DOOR DRIVE DIFFERENTIAL  
FAILURE MODE: PARTIAL OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE DIFFERENTIAL
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	3/3	ATO:	2/2
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, PARTIAL INPUT

EFFECTS/RATIONALE:

IF OUTPUT OF TORQUE FROM THE DIFFERENTIAL WERE LOW ENOUGH THE SINGLE MOTOR DRIVE TIME LIMIT WOULD BE HIT. THE CREW HAS VISUAL CUES OF PBD MOVEMENT AND POSITION. POSSIBLE LOSS OF MISSION IF FAILURE OCCURS WHEN OPENING PBD. ON CLOSING OF THE PBD FLIGHT RULES ALLOW DRIVING BEYOND SINGLE MOTOR DRIVE TIME BECAUSE VISUAL CUE EXISTS.

REFERENCES: V070-594125, FLIGHT RULES SECTION 10-MMACS

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5154 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE DIFFERENTIAL  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE DIFFERENTIAL
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	1/1		AOA:	/
DEORBIT:	1/1		ATO:	1/1
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

BINDING/JAMMING WOULD PREVENT PBD OPEN/CLOSING. FAILURE WHEN  
OPENING THE PBD CAUSES A LOSS OF MISSION. IF UNABLE TO CLOSE THE  
PBD THEN AN UNSAFE CONDITION WOULD EXIST FOR ENTRY. AN EVA  
PROCEDURE EXISTS TO CLOSE THE PBD. POSSIBLE LOSS OF CREW/VEHICLE  
IF PBD NOT SECURED CLOSE.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5155 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE GEARBOX  
FAILURE MODE: FAILS TO OPERATE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE GEARBOX
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

GEARBOX FAILURE CAUSES NO TORQUE TRANSFER TO THE PBD TORQUE SHAFT AND ROTARY ACTUATORS. PBD STOPS MOVEMENT, FAILS CLOSED, OPEN OR IN TRANSIT. LOSS OF MISSION WOULD OCCUR IF PBD COULD NOT BE OPENED FAR ENOUGH. LOSS OF CREW/VEHICLE COULD OCCUR IF PBD COULD NOT BE CLOSED. AN EVA PROCEDURE EXISTS FOR MANUAL CLOSURE OF PBD.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5156 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE GEARBOX  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE GEARBOX
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

BINDING/JAMMING CAUSES THE TORQUE LIMITERS IN EACH PBD ROTARY  
ACTUATOR TO SLIP. PBD STOPS MOVEMENT, FAILS CLOSED, OPEN OR IN  
TRANSIT. LOSS OF MISSION WOULD OCCUR IF PBD COULD NOT BE OPENED  
FAR ENOUGH. LOSS OF CREW/VEHICLE COULD OCCUR IF PBD  
COULD NOT BE CLOSED. AN EVA PROCEDURE EXISTS FOR MANUAL CLOSURE  
OF PBD.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/2  
MDAC ID: 5157 ABORT: 2/2

ITEM: PAYLOAD BAY DOOR DRIVE GEARBOX  
FAILURE MODE: PARTIAL OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE GEARBOX
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	2/2	ATO:	2/2
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

INSUFFICIENT OUTPUT WOULD NOT FULLY ROTATE THE PBD. SINGLE MOTOR  
DRIVE TIME WOULD BE REACHED BEFORE FULL PBD TRAVEL COMPLETED.  
VISUAL CUES ARE AVAILABLE TO THE CREW TO MONITOR PBD MOVEMENT.  
POSSIBLE LOSS OF MISSION. NO EFFECT ON CREW/VEHICLE.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5158 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE TORQUE SHAFT/COUPLING  
FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE TORQUE SHAFT/COUPLING
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0009 TO -0031

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

BROKEN TORQUE SHAFT/COUPLING COULD CAUSE THE LOSS OF UP TO 4 PBD ROTARY ACTUATORS. LOSS OF MISSION WOULD OCCUR IF PBD COULD NOT BE OPENED. LOSS OF CREW/VEHICLE COULD HAPPEN IF PBD COULD NOT BE CLOSED. AN EVA PROCEDURE EXISTS FOR THE MANUAL CLOSURE OF PBD.

REFERENCES: V070-594125



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5159 ABORT: 2/1R

ITEM: PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY  
FAILURE MODE: SEIZED BEARING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ F ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0008

CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART  
FAILURE, TEMPERATURE, VACUUM

EFFECTS/RATIONALE:

SEIZED BEARING WOULD HAVE NO EFFECT. EACH DOOR DRIVE SUPPORT  
BEARING ASSEMBLY HAS TWO DOUBLE SEALED/DUAL ROTATION BEARINGS.  
SINGLE BEARING WOULD CONTINUE TO TRANSMIT TORQUE BETWEEN TORQUE  
SHAFT SECTIONS. NO EFFECT ON CREW/VEHICLE FOR A SINGLE FAILURE.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5160 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING, BROKEN SUPPORT HOUSING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	1/1	AOA:	/	
DEORBIT:	1/1	ATO:	1/1	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0008

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

THE SUPPORT HOUSING BREAKING FROM THE ORBITER FUSELAGE ATTACHMENT WOULD BIND OR BREAK TORQUE SHAFT. PBD MOVEMENT WOULD BE PREVENTED. LOSS OF MISSION WOULD OCCUR IF PBD COULD NOT BE OPENED FAR ENOUGH. LOSS OF CREW/VEHICLE COULD OCCUR IF PBD COULD NOT BE CLOSED. AN EVA PROCEDURE EXISTS FOR MANUAL CLOSING OF PBD.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5161 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY  
FAILURE MODE: BROKEN SUPPORT SHAFT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0008

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN SUPPORT SHAFT COULD CAUSE THE LOSS OF 1 TO 4 ROTARY ACTUATORS. LOSS OF MISSION WOULD OCCUR IF PBD COULD NOT BE OPENED. LOSS OF CREW/VEHICLE COULD HAPPEN IF PBD COULD NOT BE CLOSED. AN EVA PROCEDURE EXISTS FOR THE MANUAL CLOSURE OF PBD.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/1R  
MDAC ID: 5162 ABORT: 3/1R

ITEM: PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE  
LIMITER  
FAILURE MODE: FAILS OUT OF TOLERANCE, TORQUE LIMITER SLIPS AT  
LESS THAN MINIMUM LIMIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE LIMITER
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0005, MC162-0008-0033

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

TORQUE LIMITER SLIPPING AT LESS THAN THE MINIMUM SPECIFIED LIMIT  
WOULD HAVE NO EFFECT. IF THERE IS NO OBSTACLE TO PBD MOVEMENT  
THE REMAINING 5 ROTARY ACTUATORS CAN OPEN/CLOSE THE PBD. IF THE  
DOOR LINKAGE ASSEMBLY WERE TO JAM THE OTHER TORQUE LIMITERS  
WOULD SLIP ALSO AND PBD MOVEMENT WOULD STOP. AN EVA CAPABILITY  
EXISTS TO MANUALLY CLOSE THE PBD.

REFERENCES: V070-594125

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5163 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE  
LIMITER

FAILURE MODE: FAILS OUT OF TOLERANCE, TORQUE LIMITER FAILS TO  
SLIP AT MAXIMUM ALLOWABLE LIMIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE LIMITER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	1/1	AOA:	/	
DEORBIT:	1/1	ATO:	1/1	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0005, MC162-0008-0033

CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE, PIECE-PART FAILURE,  
TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

POSSIBLE DAMAGE TO PBD AND/OR PBD DRIVE SYSTEM IF TORQUE LIMITER  
DOES NOT SLIP AT MAXIMUM TORQUE LIMIT. DAMAGE TO PBD COULD  
POSSIBLY CAUSE THE LOSS OF CREW/VEHICLE.

REFERENCES: V070-594125

REPORT DATE 11/25/87

C-577

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5164 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE  
LIMITER  
FAILURE MODE: TORQUE LIMITER FAILS TO OPERATE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE LIMITER
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0005, MC162-0008-0033

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
PIECE-PART FAILURE, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF TORQUE LIMITER TO RELEASE TORQUE CAUSED BY A JAM COULD  
CAUSE DAMAGE TO THE PBD AND/OR DRIVE SYSTEM. POSSIBLE LOSS OF  
MISSION IF PBD CANNOT BE OPENED OR LOSS OF CREW/VEHICLE IF CANNOT  
CLOSE PBD OR IF DOOR DAMAGE TOO SEVERE.

REFERENCES: V070-594125

REPORT DATE 11/25/87

C-578

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5165 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE  
LIMITER  
FAILURE MODE: JAMMED ROTARY ACTUATOR GEARBOX

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE LIMITER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0005, MC162-0008-0033

CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART  
FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

JAMMED ROTARY ACTUATOR GEARBOX WOULD PREVENT DOOR LINKAGE FROM  
MOVING. TORQUE LIMITERS WOULD SLIP DUE TO JAMMED LINKAGE. PBD  
OPEN/CLOSING STOPS. POSSIBLE LOSS OF CREW/VEHICLE AND MISSION.  
EVA CAPABILITY EXISTS TO MANUALLY CLOSE THE PBDS.

REFERENCES: V070-594125

REPORT DATE 11/25/87

C-579

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5166 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE  
LIMITER  
FAILURE MODE: ROTARY ACTUATOR OUTPUT ARM BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE LIMITER
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	1/1	AOA:	/	
DEORBIT:	1/1	ATO:	1/1	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0005, MC162-0008-0033

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN ROTARY ACTUATOR OUTPUT ARM WOULD LET LINKAGE PUSHROD FLOAT FREE. THE PUSHROD THEN COULD LODGE IN A POSITION WHICH WOULD JAM LINKAGE AND PREVENT PBD MOVEMENT. POSSIBLE LOSS OF CREW/VEHICLE AND MISSION. EVA COULD BE DONE TO CLEAR THE JAM.

REFERENCES: V070-594125



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5167 ABORT: 2/1R

ITEM: PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE  
LIMITER  
FAILURE MODE: BROKEN MOUNTING BRACKET

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE LIMITER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0005, MC162-0008-0033

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN MOUNTING BRACKET WOULD LESSEN STRUCTURAL INTEGRITY OF ASSEMBLY. THE 3 REMAINING MOUNTING AREAS WILL TAKE UP THE LOAD. NO EFFECT ON CREW/VEHICLE OR MISSION. POSSIBLE JAMMING COULD OCCUR IF TWO OR MORE MOUNTING POINTS FAIL.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5168 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR DRIVE LINKAGE ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE LINKAGE ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARBOARD/PORT ORBITER MIDFUSELAGE  
PART NUMBER: V070-594126-0001, V070-594130-0001, V070-59431-0001

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE

EFFECTS/RATIONALE:

BINDING/JAMMING IN DOOR DRIVE LINKAGE CAUSES ALL TORQUE LIMITER  
TO SLIP. DOOR MOVEMENT WOULD STOP. LOSS OF MISSION IF UNABLE TO  
OPEN PBD. LOSS OF CREW/VEHICLE IF UNABLE TO CLOSE PBD. EVA  
CAPABILITY EXISTS TO MANUALLY CLOSE PBDS.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/1R  
MDAC ID: 5169 ABORT: 3/1R

ITEM: PAYLOAD BAY DOOR DRIVE LINKAGE ASSEMBLY  
FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE LINKAGE ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: STARBOARD/PORT ORBITER MIDFUSELAGE  
PART NUMBER: V070-594126-0001, V070-594130-0001, V070-59431-0001

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN PUSHROD OR BELLCRANK WOULD HAVE NO EFFECT ON MISSION OR CREW/VEHICLE. REMAINING 5 DOOR DRIVE LINKAGE ASSEMBLIES WILL OPEN/CLOSE PBD.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87  
SUBSYSTEM: MECH/PBD  
MDAC ID: 5170

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: PAYLOAD BAY DOOR OPEN LIMIT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR OPEN LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	/	
LIFTOFF:	/	TAL:	/	
ONORBIT:	3/3	AOA:	/	
DEORBIT:	/	ATO:	3/3	
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD/AFT ROTARY ACTUATOR ON STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0005

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE: PBD MOTOR WOULD CONTINUE TO RUN. WITH TWO MOTORS OPERATING THE DOOR WOULD REACH FULL OPEN POSITION, TORQUE LIMITERS WOULD SLIP WHEN LINKAGES WILL NO LONGER MOVE. IN THE EVENT OF A FAILED MOTOR THE SINGLE MOTOR DRIVE TIME LIMIT WOULD BE HIT AND MOTOR SHUTDOWN. NO EFFECT ON MISSION OR CREW/VEHICLE.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/2R  
MDAC ID: 5171 ABORT: 3/2R

ITEM: PAYLOAD BAY DOOR OPEN LIMIT SWITCH  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR OPEN LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	3/2R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: FORWARD/AFT ROTARY ACTUATOR ON STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0005

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION, SHORTED

EFFECTS/RATIONALE:

OPEN LIMIT SWITCH PREMATURELY GOING TO THE OPEN POSITION WOULD  
SHUT OFF A MOTOR. REDUNDANT MOTOR WOULD CONTINUE OPENING OF PBD  
AT A REDUCED RATE. FAILURE IN BOTH SWITCHES WOULD CAUSE THE LOSS  
OF MISSION SINCE PBD COULD NOT BE OPENED. NO EFFECT ON  
CREW/VEHICLE.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5172 ABORT: /

ITEM: PAYLOAD BAY DOOR 88 DEGREES LIMIT SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR 88 DEGREES LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	/	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD/AFT ROTARY ACTUATOR ON STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0005

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

NO EFFECT ON CREW/VEHICLE OR MISSION. THIS SWITCH IS A GSE  
INDICATOR WHICH IS USED ONLY WHEN THE ORBITER IS ON THE PAD. PBD  
COULD POSSIBLY BE DAMAGED IF IT WERE TO STRIKE SERVICE STRUCTURE.

REFERENCES: V070-594125

REPORT DATE 11/25/87

C-586

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5173 ABORT: /

ITEM: PAYLOAD BAY DOOR 88 DEGREES LIMIT SWITCH  
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR 88 DEGREES LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	/	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: FORWARD/AFT ROTARY ACTUATOR ON STARBOARD/PORT PBD  
PART NUMBER: MC162-0008-0005

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION, SHORTED

EFFECTS/RATIONALE:

NO EFFECT ON CREW/VEHICLE OR MISSION. THIS SWITCH IS A GSE  
INDICATOR WHICH IS USED ONLY WHEN THE ORBITER IS ON THE PAD. PBD  
COULD STILL BE OPENED MANUALLY USING VISUAL CUES.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5174 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR  
FAILURE MODE: WARPED

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ORBITER MIDFUSELAGE, PORT AND STARBOARD SIDES  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE,  
MISRIGGED

EFFECTS/RATIONALE:

WARPED PBD COULD NOT BE LATCHED CLOSED DUE TO MISALIGNMENT  
BETWEEN LATCHES AND ROLLERS. WARPAGE DUE TO THERMAL GRADIENT CAN  
BE CORRECTED BY VARYING ORBITER ATTITUDE. IF WARPAGE CANNOT BE  
REDUCED OR ELIMINATED THEN LOSS OF CREW/VEHICLE IS POSSIBLE.  
VEHICLE WOULD HAVE REDUCED STRUCTURAL INTEGRITY IF PBDS CANNOT BE  
CLOSED.

REFERENCES: V070-594125



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 1/1  
MDAC ID: 5175 ABORT: 1/1

ITEM: PAYLOAD BAY DOOR  
FAILURE MODE: DAMAGED PANEL

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ORBITER MIDFUSELAGE, PORT AND STARBOARD SIDES  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

DAMAGED PANEL WOULD REDUCE STRUCTURAL INTEGRITY OF THE VEHICLE.  
POSSIBLE LOSS OF CREW/VEHICLE IF DAMAGE AREA IS LARGE OR AREA  
WERE TO INCREASE TO AN EXTENT THAT ENTIRE DOOR WOULD FAIL.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 2/1R  
MDAC ID: 5176 ABORT: 2/1R

ITEM: PAYLOAD BAY DOOR ALIGNMENT ROLLER  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR ALIGNMENT ROLLER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: AFT STARBOARD/PORT PBD  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE,  
MISADJUSTED

EFFECTS/RATIONALE:

JAMMED ROLLER COULD PREVENT AFT BULKHEAD LATCH GANG FROM BEING  
ENGAGED. RESULTS IN SOME LOSS OF STRUCTURAL INTEGRITY. SAFE  
ENTRY POSSIBLE WITH ONE BULKHEAD LATCH GANG NOT ENGAGED. NO  
EFFECT ON CREW/VEHICLE.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/1R  
MDAC ID: 5177 ABORT: 3/1R

ITEM: PAYLOAD BAY DOOR ALIGNMENT ROLLER GUIDE  
FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR ALIGNMENT ROLLER GUIDE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: AFT STARBOARD/PORT PAYLOAD BAY BULKHEAD  
PART NUMBER:

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN ROLLER GUIDE WOULD INCREASE STRUCTURAL LOAD ON THE  
REMAINING 3 ROLLER GUIDES. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/3  
MDAC ID: 5178 ABORT: 3/3

ITEM: PAYLOAD BAY DOOR PASSIVE STOP  
FAILURE MODE: FAILS OUT OF TOLERANCE, BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR PASSIVE STOP
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/3		AOA:	/
DEORBIT:	3/3		ATO:	3/3
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PORTSIDE MIDFUSELAGE  
PART NUMBER: V070-594117-001, V070-594117-002

CAUSES: PIECE-PART FAILURE, MISADJUSTED

EFFECTS/RATIONALE:

NO EFFECT ON CREW/VEHICLE OR MISSION DUE TO BROKEN OR MISADJUSTED  
PASSIVE STOP. IF ALL 4 WERE TO FAIL, EXCESSIVE TRAVEL BY LEFT  
PBD COULD OCCUR PREVENTING CENTERLINE LATCH CLOSURE.

REFERENCES: V070-594125

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD FLIGHT: 3/1R  
MDAC ID: 5179 ABORT: 3/1R

ITEM: PAYLOAD BAY DOOR SHEAR/FLOATING HINGE  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR SHEAR/FLOATING HINGE
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: STARBOARD/PORT ORBITER MIDFUSELAGE  
PART NUMBER:

CAUSES: PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

BINDING/JAMMING HINGE WOULD CAUSE A LOSS OF REDUNDANCY (13 TOTAL, 5 SHEAR HINGES, 8 FLOATING HINGES). NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: JSC-18341

REPORT DATE 11/25/87

C-593

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5501 ABORT: 2/1R

ITEM: CONTROL BUS 1.2K RESISTOR  
FAILURE MODE: SHORTS, RESISTANCE LOWER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DC CONTROL BUS
- 4) 1.2K RESISTOR
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13L  
PART NUMBER: A1R1, A1R2, A1R3

CAUSES: THERMAL STRESS, VIBRATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR THAT SHORTS OR WITH RESISTANCE LOWER THAN RATED VALUE WOULD ALLOW EXCESSIVE CURRENT TO REACH OTHER COMPONENTS. HIGHER CURRENT CAUSES LOSS OF COMPONENT AND LOSS OF FUNCTION. REDUNDANT ELEMENTS WILL CONTINUE OPERATION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099

REPORT DATE 11/25/87

C-594

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5502 ABORT: 2/1R

ITEM: CONTROL BUS 1.2K RESISTOR  
FAILURE MODE: OPEN CIRCUIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DC CONTROL BUS
- 4) 1.2K RESISTOR
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13L  
PART NUMBER: A1R1, A1R2, A1R3

CAUSES: THERMAL STRESS, VIBRATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR FAILURE AS AN OPEN CIRCUIT WOULD CAUSE A LOSS OF CURRENT TO OTHER COMPONENTS. THIS RESULTS IN A LOSS OF REDUNDANCY WHEN AFFECTED COMPONENTS CANNOT OPERATE. REDUNDANT ELEMENTS WILL CONTINUE OPERATION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5503 ABORT: 2/1R

ITEM: CONTROL BUS 1.2K RESISTOR  
FAILURE MODE: RESISTANCE HIGHER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DC CONTROL BUS
- 4) 1.2K RESISTOR
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13L  
PART NUMBER: A1R1, A1R2, A1R3

CAUSES: THERMAL STRESS, VIBRATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTANCE HIGHER THAN RATED VALUE WOULD REDUCE CURRENT TO THE RELAY WHICH CLOSSES TO PASS AC BUS POWER TO THE ACTUATOR MOTORS. LOGIC CIRCUIT INPUT WOULD BE LOW SIGNIFYING RELAY NEED NOT BE CLOSED. REDUNDANT MCA WOULD ALLOW AC POWER TO REACH ACTUATOR MOTORS. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099, RELAY CONTROL AC POWER IN MCA



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5504 ABORT: 2/1R

ITEM: PAYLOAD BAY DOORS CONTROL SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DC CONTROL BUS
- 4) PAYLOAD BAY DOORS OPEN-CLOSE SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13L  
PART NUMBER: S3

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF PAYLOAD BAY DOORS CONTROL SWITCH TO SWITCH TO THE  
DESIRED COMMAND (OPEN-STOP-CLOSE) CAUSES A LOSS OF REDUNDANCY.  
PBDS CAN BE COMMANDED IN THE DESIRED DIRECTION BY USING THE DEU  
ON PANEL R12. THE "PBD SW BYPASS" ENTRY WILL ALLOW SOFTWARE  
CONTROL OF THE SWITCH FUNCTIONS. NO EFFECT ON CREW/VEHICLE OR  
MISSION.

REFERENCES: VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5505 ABORT: 2/1R

ITEM: FUSE, 1A  
FAILURE MODE: OPEN (ELECTRICAL), FAILS OUT OF TOLERANCE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DC CONTROL BUS
- 4) FUSE, 1A
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13A2  
PART NUMBER: F37-F42

CAUSES: VIBRATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART  
FAILURE

EFFECTS/RATIONALE:

FAILED FUSE CAUSES A LOSS OF REDUNDANCY. FAILURE CAUSES LOSS OF  
DC POWER TO RELAYS WHICH ARE CLOSED TO SUPPLY AC POWER TO  
ACTUATOR MOTORS. REDUNDANT ELEMENTS WILL COMPLETE ACTUATOR  
OPERATION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR  
MISSION.

REFERENCES: VS72-956099

REPORT DATE 11/25/87

C-598

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5506 ABORT: 2/1R

ITEM: PAYLOAD BAY DOOR MECHANICAL POWER SWITCH  
FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DC CONTROL BUS
- 4) PAYLOAD BAY DOOR MECHANICAL POWER SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13A2  
PART NUMBER: S13 (SYS 1), S14 (SYS 2)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF PBD MECHANICAL POWER SWITCH TO GO TO THE COMMANDED POSITION CAUSES A LOSS OF REDUNDANCY. POWER COULD STILL BE APPLIED TO THE ACTUATOR MOTOR RELAYS AND MCA LOGIC RELAYS BY USING THE DEU ON PANEL R12. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099

REPORT DATE 11/25/87

C-599

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87  
SUBSYSTEM: MECH/PBD/EPD&C  
MDAC ID: 5507

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: MAIN DC BUS RELAY  
FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) MAIN DC BUS RELAY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: ORBITER MID FUSELAGE, MID MCA-1, -2, -3, -4  
PART NUMBER: K78, K66, K37, K39, K54, K42, K22, K20, K29, K41

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

RELAY IS USED TO SUPPLY AC BUS POWER TO PAYLOAD BAY DOOR DRIVE MOTORS, CENTERLINE AND BULKHEAD LATCH ACTUATOR MOTORS. FAILURE OF RELAY CAUSES AN OPEN CIRCUIT AND THE LOSS OF A MOTOR. THE REDUNDANT MOTOR CONTINUES THE PARTICULAR FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099

REPORT DATE 11/25/87

C-600

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 3/3  
MDAC ID: 5508 ABORT: 3/3

ITEM: MAIN DC BUS RELAY  
FAILURE MODE: FAILS TO OPEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) MAIN DC BUS RELAY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ORBITER MID FUSELAGE, MID MCA-1, -2, -3, -4  
PART NUMBER: K78, K66, K37, K39, K54, K42, K22, K20, K29, K41

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

FAILURE OF RELAY TO OPEN HAS NO EFFECT ON CREW/VEHICLE OR  
MISSION. AC MOTOR POWER WILL BE REMOVED WHEN SECOND RELAY IN THE  
PAIR OPENS OR VIA DEU COMMANDS.

REFERENCES: VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 3/3  
MDAC ID: 5509 ABORT: 3/3

ITEM: DIODE  
FAILURE MODE: OPEN CIRCUIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) DIODE
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13A2  
PART NUMBER: A3CR1, A3CR2, A3CR3, A3CR4

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

OPEN CIRCUIT FAILURE MODE CAUSES A LOSS OF INPUT TO PAYLOAD BAY TALKBACK. PAYLOAD BAY DOORS STATUS IS DISPLAYED ON CRT SO FAILURE HAS NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099

REPORT DATE 11/25/87

C-602

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 3/3  
MDAC ID: 5510 ABORT: 3/3

ITEM: DIODE  
FAILURE MODE: SHORTED OUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) DIODE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13A2  
PART NUMBER: A3CR1, A3CR2, A3CR3, A3CR4

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL  
SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

DIODE PREVENTS SIGNAL FROM ONE MDM FEEDING BACK INTO THE OTHER.  
SHORTED DIODE WOULD ALLOW FEEDBACK INTO MDM. FEEDBACK WOULD HAVE  
NO EFFECT. TALKBACK AND VISUAL CUES WOULD SHOW PBD POSITION. NO  
EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099

REPORT DATE 11/25/87

C-603

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5511 ABORT: 2/1R

ITEM: SWITCH RESISTOR, 1.2K 2W  
FAILURE MODE: SHORTS, RESISTANCE LOWER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) SWITCH RESISTOR, 1.2K 2W
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MID FUSELAGE MOTOR CONTROL ASSEMBLIES -1, -2, -3, -4

PART NUMBER: SEE PAGES 56AB, AC, AD, AH, AJ IN REFERENCE

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR THAT SHORTS OR WITH RESISTANCE LOWER THAN RATED VALUE WOULD ALLOW EXCESSIVE CURRENT TO REACH RELAY AC MOTOR POWER LOGIC GATE. HIGHTER CURRENT CAUSES LOSS OF COMPONENT. POSSIBLE PREMATURE AC MOTOR POWER SHUT OFF. REDUNDANT MOTOR WOULD COMPLETE FUNCTION BUT AT A REDUCED RATE.

REFERENCES: VS72-956099



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 3/3  
MDAC ID: 5512 ABORT: 3/3

ITEM: SWITCH RESISTOR, 1.2K 2W  
FAILURE MODE: OPEN CIRCUIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) SWITCH RESISTOR, 1.2K 2W
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MID FUSELAGE MOTOR CONTROL ASSEMBLIES -1, -2, -3, -4

PART NUMBER: SEE PAGES 56AB, AC, AD, AH, AJ IN REFERENCE

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR FAILURE AS AN OPEN CIRCUIT CAUSES MOTOR TO CONTINUE TO RUN. RELAY WOULD NOT GET INPUT SIGNIFYING DOOR OR LATCHES WERE IN DESIRED POSITION. MOTOR WOULD STALL WHEN LIMIT REACHED. CREW CAN REMOVE AC MOTOR POWER. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5513 ABORT: 2/1R

ITEM: SWITCH RESISTOR, 1.2K 2W  
FAILURE MODE: RESISTANCE HIGHER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) SWITCH RESISTOR, 1.2K 2W
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MID FUSELAGE MOTOR CONTROL ASSEMBLIES -1, -2, -3, -4

PART NUMBER: SEE PAGES 56AB, AC, AD, AH, AJ IN REFERENCE

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTANCE HIGHER THAN RATED VALUE WOULD REDUCE CURRENT TO THE RELAY CONTROLLING AC POWER TO THE ACTUATOR MOTOR. LOGIC CIRCUIT INPUT WOULD BE LOW SIGNIFYING DOOR OR LATCHES WERE IN THE DESIRED POSITION. RELAY WOULD OPEN AND AC POWER WOULD BE REMOVED FROM ACTUATOR MOTOR. REDUNDANT ELEMENTS WOULD CONTINUE FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099

REPORT DATE 11/25/87

C-606

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5514 ABORT: 2/1R

ITEM: PAYLOAD BAY DOORS AC BUS RELAY  
FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) PAYLOAD BAY DOORS AC BUS RELAY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MID FUSELAGE MOTOR CONTROL ASSEMBLIES -1, -2, -3, -4

PART NUMBER: SEE PAGES 56AB, AC, AD, AH, AJ IN REFERENCE

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

RELAY IS USED TO CONNECT THE 3 PHASE AC POWER TO THE ACTUATOR MOTORS FOR OPENING/CLOSING PAYLOAD BAY DOORS OR OPERATING THE LATCHES. FAILURE OF RELAY CAUSES AN OPEN CIRCUIT AND THE LOSS OF A MOTOR. THE REDUNDANT MOTOR CONTINUES THE PARTICULAR FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099

REPORT DATE 11/25/87

C-607

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5515 ABORT: 2/1R

ITEM: PAYLOAD BAY DOORS AC BUS RELAY  
FAILURE MODE: FAILS TO OPEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) PAYLOAD BAY DOORS AC BUS RELAY
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MID FUSELAGE MOTOR CONTROL ASSEMBLIES -1, -2, -3, -4

PART NUMBER: SEE PAGES 56AB, AC, AD, AH, AJ IN REFERENCE

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF RELAY TO OPEN CAUSES THE LOSS OF AN ACTUATOR MOTOR. RELAY IS USED TO CHANNEL THE THREE PHASE AC BUS POWER TO THE ACTUATOR MOTOR (A-B-C OR A-C-B). IF RELAY USED IN RELEASING LATCHES AND OPENING PBD FAILS TO OPEN THEN WHEN PBD CLOSURE IS BEGUN THE B AND C PHASE REVERSAL WILL NOT OCCUR. REDUNDANT MOTOR WILL COMPLETE FUNCTION. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5516 ABORT: 2/1R

ITEM: MCA AC POWER CIRCUIT BREAKER  
FAILURE MODE: OPEN (ELECTRICAL), FAILS OUT OF TOLERANCE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DISPLAY AND CONTROL
- 4) AC 3 PHASE BUS
- 5) MCA AC POWER CIRCUIT BREAKER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: PANEL MA73C  
PART NUMBER: CB12, CB7, CB9, CB13, CB2, CB3

CAUSES: OVERLOAD, PIECE-PART FAILURE, INADVERTENT OPERATION

EFFECTS/RATIONALE:

FAILURE OF CIRCUIT BREAKER CAUSES LOSS OF THE THREE PHASE AC POWER FROM THE MAIN AC BUS. REDUNDANT MOTOR WILL COMPLETE FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: JSC-11174

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5517 ABORT: 2/1R

ITEM: MCA RELAY LOGIC POWER SWITCH  
FAILURE MODE: FAILS OFF

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DISPLAY AND CONTROL
- 4) CONTROL BUS
- 5) MCA RELAY LOGIC POWER SWITCH
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL MA73C  
PART NUMBER: S12, S7, S9, S13, S2, S3

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

SWITCH FAILING OFF CAUSES AN OPEN CIRCUIT AND THE LOSS OF CONTROL SIGNAL TO THE ASSOCIATED RPC. REDUNDANT RPC FOR FUNCTION WOULD ALLOW OPERATION TO BE COMPLETED BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 3/3  
MDAC ID: 5518 ABORT: 3/3

ITEM: MCA RELAY LOGIC POWER SWITCH  
FAILURE MODE: FAILS ON

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DISPLAY AND CONTROL
- 4) CONTROL BUS
- 5) MCA RELAY LOGIC POWER SWITCH
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL MA73C  
PART NUMBER: S12, S7, S9, S13, S2, S3

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:  
SWITCH FAILING IN THE ON POSITION HAS NO EFFECT ON CREW/VEHICLE  
OR MISSION.

REFERENCES: JSC-11174

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R  
MDAC ID: 5519 ABORT: 2/1R

ITEM: REMOTE POWER CONTROLLER  
FAILURE MODE: FAILS OFF

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DISPLAY AND CONTROL
- 4) CONTROL BUS
- 5) MCA RELAY LOGIC POWER SWITCH
- 6) REMOTE POWER CONTROLLER
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	2/1R		AOA:	/
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION:  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,  
VIBRATION

EFFECTS/RATIONALE:

LOSS OF A REMOTE POWER CONTROLLER CAUSES A LOSS OF REDUNDANCY.  
SECOND RPC PERMITS CONTINUED PBD OPERATION WITH REDUNDANT MOTORS.  
NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: JSC-11174

REPORT DATE 11/25/87

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C.6

PAYLOAD BAY RADIATORS ANALYSIS WORKSHEETS

# PAYLOAD BAY RADIATORS ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT	ABORT	SCREENS			
	H/F	H/F	A	B	C	
6101	3/1R	/NA	P	P	P	MOTOR
6102	3/3	/NA				MOTOR BRAKE
6103	3/3	/NA				MOTOR BRAKE
6104	3/3	/NA				TORQUE LIMITER
6105	3/3	/NA				TORQUE LIMITER
6106	3/1R	/NA	P	P	P	DIFFERENTIAL ASSEMBLY
6107	3/1R	/NA	P	P	P	GEARBOX
6108	3/1R	/NA	P	P	P	GEARBOX
6109	3/3	/NA				LIMIT SW, RELEASE (S1),(S3),(S4)
6110	3/3	/NA				LIMIT SW, LATCH (S2),(S3),(S4)
6111	3/1R	/NA	P	P	P	LATCH TORQUE SHAFT ASSEMBLY
6112	3/3	/NA				LATCH ROTARY ACTUATOR
6113	3/3	/NA				LATCH HOOK MECHANISM
6201	3/1R	/NA	P	P	P	MOTOR
6202	3/3	/NA				MOTOR BRAKE
6203	3/3	/NA				MOTOR BRAKE
6204	3/3	/NA				TORQUE LIMITER
6205	3/3	/NA				TORQUE LIMITER
6206	3/1R	/NA	P	P	P	DIFFERENTIAL ASSEMBLY
6207	3/1R	/NA	P	P	P	GEARBOX
6208	3/1R	/NA	P	P	P	GEARBOX
6209	3/3	/NA				LIMIT SW, DEPLOY (S1,S2,S4)
6210	3/3	/NA				LIMIT SW, STOW (S1,S2,S3)
6211	3/1R	/NA	P	P	P	DEPLOYMENT TORQUE SHAFT
6212	3/3	/NA				DEPLOYMENT ROTARY ACTUATOR
6213	3/3	/NA				DEPLOYMENT CRANK AND LINK
6301	3/1R	/NA	P	P	P	HINGE FITTINGS/POINTS
6302	3/1R	/NA	P	P	P	HINGE FITTINGS/POINTS
6501	3/3	/NA				LATCH CONTROL SWITCH (S4/S6)
6502	3/3	/NA				LATCH CONTROL SWITCH (S4/S6)
6503	3/1R	/NA	P	P	P	LATCH CONTROL SWITCH (S4/S6)
6504	3/3	/NA				LATCH CONTROL SWITCH (S4/S6)
6507	3/3	/NA				RADIATOR CONTROL SWITCH (S5/S7)
6508	3/3	/NA				RADIATOR CONTROL SWITCH (S5/S7)
6509	3/1R	/NA	P	P	P	RADIATOR CONTROL SWITCH (S5/S7)
6510	3/3	/NA				RADIATOR CONTROL SWITCH (S5/S7)

(\*) Potential Critical Items.

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/1R  
MDAC ID: 6101 ABORT: /NA

ITEM: MOTOR  
FAILURE MODE: LOSS OF OUTPUT, FAILS TO START

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) MOTOR
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC287-0037-0001 (TWO MOTORS PER PDU)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF ONE MOTOR/POWER SOURCE IN A PDU RESULTS IN TWICE THE NORMAL DRIVE TIME TO RELEASE/LATCH ONE SIX-LATCH GANG FOR THE AFFECTED RADIATOR PANEL. FAILURE OF SECOND MOTOR IS LOSS OF CAPABILITY TO RELEASE/LATCH THAT PANEL. IF UNABLE TO RELEASE, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATION DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

REFERENCES: V070-594450, SSSH DWG NO 14.1

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/01/87  
SUBSYSTEM: MECH/PBR  
MDAC ID: 6102

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /NA

ITEM: MOTOR BRAKE  
FAILURE MODE: PHYSICAL BINDING/JAMMING, FAILS TO SWITCH, FAILS  
TO DISENGAGE

LEAD ANALYST: W.T. SLAUGHTER

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) MOTOR BRAKE
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC287-0037-0001 (TWO MOTORS PER PDU)

CAUSES: ERRONEOUS INPUT, PIECE-PART FAILURE, STRUCTURAL FAILURE,  
LOSS OF INPUT

EFFECTS/RATIONALE:  
FAILURE RESULTS IN LOSS OF OUTPUT FOR AFFECTED MOTOR CAUSING  
TWICE THE NORMAL DRIVE TIME TO RELEASE/LATCH.

REFERENCES: V070-594450, SSSH DWG NO 14.1

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6103 ABORT: /NA

ITEM: MOTOR BRAKE  
FAILURE MODE: PHYSICAL BINDING/JAMMING, FAILS TO SWITCH, FAILS  
TO ENGAGE

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) MOTOR BRAKE
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC287-0037-0001 (TWO MOTORS PER PDU)

CAUSES: ERRONEOUS INPUT, PIECE-PART FAILURE, STRUCTURAL FAILURE,  
LOSS OF INPUT

EFFECTS/RATIONALE:

BRAKES ARE DESIGNED TO PREVENT MOTORS FROM TURNING WHEN THE  
MECHANISM IS UNPOWERED AND TO PREVENT A FAILED MOTOR FROM BEING  
DRIVEN VIA THE DIFFERENTIAL WHILE THE OTHER MOTOR IS TURNING.  
FAILURE OF A MOTOR BRAKE TO ENGAGE IS NOT DETECTABLE AND HAS NO  
APPARENT EFFECT UNLESS THE ASSOCIATED MOTOR FAILS. IN THIS  
EVENT, BACKDRIVE FROM MOTOR #2 VIA THE DIFFERENTIAL IS PROBABLE,  
BUT THE NEAR TERM EFFECTS ARE RELATIVELY INCONSEQUENTIAL.

REFERENCES: V070-594450, SSSH DWG NO 14.1

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6104 ABORT: /NA

ITEM: TORQUE LIMITER  
FAILURE MODE: FAILS OUT OF TOLERANCE - HIGH, FAILS TO SLIP

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) TORQUE LIMITER
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC287-0037-0001 (TWO MOTORS PER PDU)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

FAILURE OF A TORQUE LIMITER CLUTCH TO SLIP IN RESPONSE TO THE PDU OUTPUT REACHING/EXCEEDING A SET LIMIT COULD RESULT IN STRUCTURAL OR MECHANICAL DAMAGE AND/OR STALLING AND OVERHEATING OF THE DRIVING MOTOR. LOSS OF ONE MOTOR RESULTS IN SINGLE MOTOR DRIVE TIME TO LATCH/RELEASE SIX-LATCH GANG FOR THAT RADIATOR PANEL.

REFERENCES: V070-594450, SSSH DWG NO 14.1

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6105 ABORT: /NA

ITEM: TORQUE LIMITER  
FAILURE MODE: FAILS OUT OF TOLERANCE - LOW, FAILS TO ENGAGE

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) TORQUE LIMITER
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC287-0037-0001 (TWO MOTORS PER PDU)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

IN THIS MODE THE RIGHT CLUTCH PLATE/SPRING WASHER/FRICTION RINGS FAIL IN SUCH A MANNER AS TO ALLOW THE DRIVE GEAR TO ROTATE FREE OF THE OUTPUT SHAFT. HENCE, THE ROTARY INPUT OF ONE DRIVE MOTOR IS LOST AND THE RELEASE/LATCH STATE WILL BE EFFECTED IN SINGLE MOTOR DRIVE TIME.

REFERENCES: V070-594450, SSSH DWG NO 14.1

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/01/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/1R  
MDAC ID: 6106 ABORT: /NA

ITEM: DIFFERENTIAL ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,  
STRIPPED TEETH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) DIFFERENTIAL ASSEMBLY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

WORSE CASE FAILURE OF THE DIFFERENTIAL ASSEMBLY IS COMPLETE LOSS OF THE OUTPUT OF A PDU AND RESULTANT INABILITY TO RELEASE/LATCH THE ASSOCIATED RADIATOR PANEL. IF UNABLE TO RELEASE, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

REFERENCES: V070-594450, SSSH DWG NO 14.1

REPORT DATE 11/25/87 C-620



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/1R  
MDAC ID: 6107 ABORT: /NA

ITEM: GEARBOX  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,  
FROZEN GEARS

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) GEARBOX
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
TEMPERATURE

EFFECTS/RATIONALE:

IN THIS MODE TORQUE LIMITERS WILL RELEASE AT THE PRESENT LIMIT TO ALLOW BOTH DRIVING MOTORS TO RUN FREE OF THE OUTPUT SHAFT. THIS WILL RESULT IN THE LOSS OF OUTPUT OF A PDU AND INABILITY TO RELEASE OR LATCH THE ASSOCIATED RADIATOR PANEL. IF UNABLE TO RELEASE, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

REFERENCES: V070-594450, SSSH DWG NO 14.1

REPORT DATE 11/25/87 C-621

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/1R  
MDAC ID: 6108 ABORT: /NA

ITEM: GEARBOX  
FAILURE MODE: STRUCTURAL FAILURE, LOSS OF OUTPUT, STRIPPED TEETH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) GEARBOX
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
STRUCTURAL FAILURE

EFFECTS/RATIONALE:

IN THIS MODE GEARBOX FAILS IN SUCH A MANNER AS TO TRANSMIT REDUCED OR NO ROTARY MOTION TO PDU OUTPUT SHAFT. WORSE CASE EFFECT IS COMPLETE LOSS OF PDU OUTPUT RESULTING IN INABILITY TO RELEASE OR LATCH THE AFFECTED RADIATOR PANEL. IF UNABLE TO RELEASE, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

REFERENCES: V070-594450, SSSH DWG NO 14.1

REPORT DATE 11/25/87

C-622

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6109 ABORT: /NA

ITEM: LIMIT SWITCHES, RELEASE (S1), (S3), (S4)  
FAILURE MODE: FAILS TO CLOSE, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) LIMIT SWITCHES, RELEASE
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/NA		RTLS:	/NA
LIFTOFF:	/NA		TAL:	/NA
ONORBIT:	3/3		AOA:	/NA
DEORBIT:	3/3		ATO:	/NA
LANDING/SAFING:	/NA			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0001

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF A REDUNDANT PAIR OF RELEASE LIMIT SWITCHES WITHIN A PDU WILL ALLOW THE MECHANISM TO CONTINUE TO DRIVE TOWARDS THE RELEASE STATE UNTIL (1) THE RELEASE COMMAND SIGNAL IS REMOVED, (2) TORQUE LIMITER SETTINGS ARE REACHED, OR (3) STRUCTURAL FAILURE IS EXPERIENCED SOME POINT IN THE DRIVE TRAIN DOWNSTREAM OF THE TORQUE LIMITERS. PORT (STARBOARD) INDICATOR, DS4(DS2) ON PANEL R13L WILL SHOW BARBERPOLE ALTHOUGH LATCHES FOR THE AFFECTED PANEL ARE IN THE RELEASE STATE.

REFERENCES: VS70-590409, VS70-960099, SSSH DWG. N. 15.6

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6110 ABORT: /NA

ITEM: LIMIT SWITCHES, LATCH (S2), (S3), (S4)  
FAILURE MODE: FAILS TO CLOSE, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) LIMIT SWITCHES, LATCH
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0001

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF A REDUNDANT PAIR OF LATCH LIMIT SWITCHES WITHIN A PDU WILL ALLOW THE MECHANISM TO CONTINUE TO DRIVE TOWARDS THE LATCH STATE UNTIL (1) THE LATCH COMMAND SIGNAL IS REMOVED, (2) TORQUE LIMITER SETTINGS ARE REACHED, OR (3) STRUCTURAL FAILURE IS EXPERIENCED AT SOME POINT IN THE DRIVE TRAIN DOWNSTREAM OF THE TORQUE LIMITERS. PORT (STARBOARD) INDICATOR, DS4(DS2) ON PANEL R13L WILL SHOW BARBERPOLE ALTHOUGH LATCHES FOR THE AFFECTED PANEL ARE IN THE LATCH STATE.

REFERENCES: VS70-590409, VS70-960099, SSSH DWG. N. 15.6

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PBR  
MDAC ID: 6111

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /NA

ITEM: LATCH TORQUE SHAFT ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE  
(RUPTURE)

LEAD ANALYST: W.T. SLAUGHTER

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH TORQUE SHAFT ASSEMBLY
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/NA		RTLS:	/NA
LIFTOFF:	/NA		TAL:	/NA
ONORBIT:	3/3		AOA:	/NA
DEORBIT:	3/1R		ATO:	/NA
LANDING/SAFING:	/NA			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS

PART NUMBER: V070-594480-001/002/003/004, V070-594490-001/002

CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

WITH A BROKEN/DISCONNECTED TORQUE SHAFT, AT LEAST ONE PAIR OF LATCHES WILL DRIVE TO THE RELEASE/LATCH STATE. WITH A BINDING/JAMMED SHAFT SEGMENT, TORQUE LIMITERS WILL ACTIVATE AT PRESET LIMIT TO PREVENT MOTOR BURN OUT AND CAPABILITY TO RELEASE/LATCH THE EFFECTED RADIATOR PANEL IS LOST. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

REFERENCES: V070-594450, SSSH DWG. NO. 14.1

REPORT DATE 11/25/87

C-625

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6112 ABORT: /NA

ITEM: LATCH ROTARY ACTUATOR  
FAILURE MODE: STRUCTURAL FAILURE (RUPTURE), LOSS OF OUTPUT,  
STRIPPED TEETH/GEARS, BROKEN OUTPUT ARM

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH ROTARY ACTUATOR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-147-0016-0001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
STRUCTURAL FAILURE

EFFECTS/RATIONALE:

IN THIS MODE PDU OUTPUT IS INTACT AND IS TRANSMITTED TO THE  
ROTARY ACTUATOR (IN TERMS OF EFFECT, A BINDING/JAMMED ACTUATOR IS  
TREATED AS A FAILED LATCH TORQUE SHAFT ASSEMBLY). DUE TO  
INTERNAL SLIPPAGE OR A BROKEN OUTPUT ARM, MOTION IS NOT OUTPUT TO  
THE LATCH HOOK MECHANISM RESULTING IN THE INABILITY TO  
RELEASE/LATCH THE ASSOCIATED PAIR OF LATCHES. REMAINING LATCH  
PAIR(S) WILL DRIVE TO THE COMMANDED STATE; INDICATORS ON PANEL  
R13L SHOULD SHOW BARBERPOLE ALTHOUGH REMAINING LATCHES WILL BE IN  
THE COMMANDED STATE.

REFERENCES: V070-594450, SSSH DWG. NO. 14.1

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6113 ABORT: /NA

ITEM: LATCH HOOK MECHANISM  
FAILURE MODE: FAILS TO RELEASE/LATCH, PHYSICAL BINDING/JAMMING,  
STRUCTURAL FAILURE (RUPTURE)

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH HOOK MECHANISM
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: V070-594460-001, VS070-594470-001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
STRUCTURAL FAILURE

EFFECTS/RATIONALE:

THE MOST PLAUSIBLE EFFECT OF A FAILED LATCH HOOK MECHANISM COMPONENT (BELLCRANK, BELLCRANK ATTACHMENT, PUSH-PULL ROD, ADJUSTABLE STOP, LINK, LATCH ROLLER) IS THE LOSS OF THE ABILITY TO RELEASE/LATCH A SINGLE LATCH. WORST CASE FAILURE IS THE LOSS OF ABILITY TO RELEASE/LATCH A LATCH PAIR. EITHER CASE IS CONSIDERED A CRITICALITY THREE (3) AS IT WILL NOT AFFECT MISSION CONTINUANCE.

REFERENCES: V070-594450, SSSH DWG. NO. 14.1

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87  
SUBSYSTEM: MECH/PBR  
MDAC ID: 6201

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /NA

ITEM: MOTOR  
FAILURE MODE: LOSS OF OUTPUT, FAILS TO START

LEAD ANALYST: W.T. SLAUGHTER

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) MOTOR
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/NA		RTLS:	/NA
LIFTOFF:	/NA		TAL:	/NA
ONORBIT:	3/3		AOA:	/NA
DEORBIT:	3/1R		ATO:	/NA
LANDING/SAFING:	/NA			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0002 (TWO MOTORS PER PDU)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF ONE MOTOR/POWER SOURCE IN A PDU RESULTS IN TWICE THE NORMAL DRIVE TIME TO DEPLOY STOW THE TWO RADIATOR PANELS (PORT OR STARBOARD) DRIVEN BY THAT PDU. FAILURE OF SECOND MOTOR IS LOSS OF CAPABILITY TO DEPLOY/STOW THE AFFECTED PAIR OF PANELS. IF UNABLE TO DEPLOY, TOTAL COOLING CAPABILITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO STOW, PLBD CLOSURE IS UNLIKELY AND LOSS OF VEHICLE AND CREW MAY RESULT.

REFERENCES: V070-594400; SSSH DWG. NO 14.1

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6202 ABORT: /NA

ITEM: MOTOR BRAKE  
FAILURE MODE: PHYSICAL BINDING/JAMMING, FAILS TO SWITCH, FAILS  
TO DISENGAGE

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) MOTOR BRAKE
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0002 (TWO MOTORS PER PDU)

CAUSES: ERRONEOUS INPUT, PIECE-PART FAILURE, STRUCTURAL FAILURE,  
LOSS OF INPUT

EFFECTS/RATIONALE:  
FAILURE RESULTS IN LOSS OF OUTPUT FOR AFFECTED MOTOR CAUSING  
TWICE THE NORMAL DRIVE TIME TO DEPLOY/STOW.

REFERENCES: V070-594400; SSSH DWG. NO 14.1

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6203 ABORT: /NA

ITEM: MOTOR BRAKE  
FAILURE MODE: PHYSICAL BINDING/JAMMING, FAILS TO SWITCH, FAILS  
TO DISENGAGE

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) MOTOR BRAKE
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0002 (TWO MOTORS PER PDU)

CAUSES: ERRONEOUS INPUT, PIECE-PART FAILURE, STRUCTURAL FAILURE,  
LOSS OF INPUT

EFFECTS/RATIONALE:

BRAKES ARE DESIGNED TO PREVENT MOTORS FROM TURNING WHEN THE  
MECHANISM IS UNPOWERED AND TO PREVENT A FAILED MOTOR FROM BEING  
DRIVEN VIA THE DIFFERENTIAL WHILE THE OTHER MOTOR IS TURNING.  
FAILURE OF A MOTOR BRAKE IS NOT DETECTABLE AND HAS NO  
APPARENT EFFECT UNLESS THE ASSOCIATED MOTOR FAILS. IN THIS  
EVENT, BACKDRIVE FROM MOTOR #2 IS PROBABLE, BUT THE NEAR-TERM  
EFFECTS ARE RELATIVELY INCONSEQUENTIAL.

REFERENCES: V070-594400; SSSH DWG. NO 14.1

REPORT DATE 11/25/87

C-630

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6204 ABORT: /NA

ITEM: TORQUE LIMITER  
FAILURE MODE: FAILS OUT OF TOLERANCE-HIGH, FAILS TO SLIP

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) TORQUE LIMITER
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0002 (TWO MOTORS PER PDU)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

FAILURE OF A TORQUE LIMITER CLUTCH TO SLIP IN RESPONSE TO THE PDU OUTPUT REACHING/EXCEEDING A SET LIMIT COULD RESULT IN STRUCTURAL OR MECHANICAL DAMAGE AND/OR STALLING AND OVERHEATING OF THE DRIVING MOTOR. LOSS OF ONE MOTOR RESULTS IN SINGLE MOTOR DRIVE TIME TO DEPLOY/STOW THE AFFECTED RADIATOR PANELS (PORT OR STARBOARD).

REFERENCES: V070-594400; SSSH DWG. NO 14.1

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6205 ABORT: /NA

ITEM: TORQUE LIMITER  
FAILURE MODE: FAILS OUT OF TOLERANCE-LOW, FAILS TO ENGAGE

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) TORQUE LIMITER
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0002 (TWO MOTORS PER PDV)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

IN THIS MODE THE RIGHT CLUTCH PLATE/SPRING WASHER/FRICTION RINGS FAIL IN SUCH A MANNER AS TO ALLOW THE DRIVE GEAR TO ROTATE FREE OF THE OUTPUT SHAFT. HENCE, THE ROTARY OUTPUT OF ONE DRIVE MOTOR IS LOST AND THE COMMANDED DEPLOY/STATE WILL BE EFFECTED IN SINGLE MOTOR DRIVE TIME.

REFERENCES: V070-594400; SSSH DWG. NO 14.1

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87  
SUBSYSTEM: MECH/PBR  
MDAC ID: 6206

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /NA

ITEM: DIFFERENTIAL ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,  
STRIPPED TEETH

LEAD ANALYST: W.T. SLAUGHTER

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) DIFFERENTIAL ASSEMBLY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0002

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

WORSE CASE FAILURE OF THE DIFFERENTIAL ASSEMBLY IS COMPLETE LOSS OF THE OUTPUT OF THE PDU AND THE RESULTANT INABILITY TO DEPLOY/STOW THE ASSOCIATED PAIR OF RADIATOR PANELS (PORT OR STARBOARD). IF UNABLE TO DEPLOY, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO STOW, PLBD CLOSURE IS UNLIKELY AND LOSS OF VEHICLE AND CREW MAY RESULT.

REFERENCES: V070-594400; SSSH DWG. NO 14.1

REPORT DATE 11/25/87

C-633

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87  
SUBSYSTEM: MECH/PBR  
MDAC ID: 6207

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /NA

ITEM: GEARBOX  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,  
FROZEN GEARS

LEAD ANALYST: W.T. SLAUGHTER

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) GEARBOX
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0002

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
TEMPERATURE

EFFECTS/RATIONALE:

IN THIS MODE TORQUE LIMITERS WILL RELEASE AT THE PRESENT LIMIT TO ALLOW BOTH DRIVING MOTORS TO RUN FREE OF THE OUTPUT SHAFT. THIS WILL RESULT IN LOSS OF OUTPUT OF THE PDU AND INABILITY TO DEPLOY/STOW THE ASSOCIATED PAIR OF RADIATOR PANELS (PORT OR STARBOARD). IF UNABLE TO DEPLOY, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO STOW, PLBD CLOSURE IS UNLIKELY AND LOSS OF VEHICLE AND CREW MAY RESULT.

REFERENCES: V070-594400; SSSH DWG. NO 14.1

REPORT DATE 11/25/87

C-634

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/1R  
MDAC ID: 6208 ABORT: /NA

ITEM: GEARBOX  
FAILURE MODE: STRUCTURAL FAILURE, LOSS OF OUTPUT, STRIPPED TEETH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) GEARBOX
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0002

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
STRUCTURAL FAILURE

EFFECTS/RATIONALE:

IN THIS MODE THE GEARBOX FAILS IN SUCH A MANNER AS TO TRANSMIT REDUCED OR NO ROTARY MOTION TO THE PDU OUTPUT SHAFT. WORSE CASE EFFECT IS COMPLETE LOSS OF OUTPUT OF THE PDU RESULTING IN INABILITY TO DEPLOY/STOW THE ASSOCIATED PAIR OF RADIATOR PANELS (PORT OR STARBOARD). IF UNABLE TO DEPLOY, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS. IF UNABLE TO STOW, PLBD CLOSURE IS UNLIKELY AND LOSS OF VEHICLE AND CREW MAY RESULT.

REFERENCES: V070-594400; SSSH DWG. NO 14.1

REPORT DATE 11/25/87

C-635

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6209 ABORT: /NA

ITEM: LIMIT SWITCHES, DEPLOY (S1, S2, S4)  
FAILURE MODE: FAILS TO CLOSE, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) LIMIT SWITCHES, DEPLOY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0002

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF A REDUNDANT PAIR OF DEPLOY LIMIT SWITCHES WITHIN THE PDU WILL ALLOW THE MECHANISM TO CONTINUE TO DRIVE TOWARDS THE DEPLOY STATE UNTIL 1) THE DEPLOY COMMAND SIGNAL IS REMOVED, 2) TORQUE LIMITER SETTINGS ARE REACHED, OR 3) STRUCTURAL FAILURE IS EXPERIENCED AT SOME POINT IN THE DRIVE TRAIN DOWNSTREAM OF THE TORQUE LIMITERS. PORT (STARBOARD) INDICATOR, DS5 (DS3) ON PANEL R13L WILL SHOW BARBERPOLE ALTHOUGH THE ASSOCIATED PAIR OF RADIATOR PANELS IS IN THE DEPLOY STATE.

REFERENCES: VS70-590409; VS70-960099; SSSH DWG. NO 15.6

REPORT DATE 11/25/87 C-636



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6210 ABORT: /NA

ITEM: LIMIT SWITCHES, STOW (S1, S2, S3)  
FAILURE MODE: FAILS TO CLOSE, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) LIMIT SWITCHES, DEPLOY
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-287-0037-0002

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF A REDUNDANT PAIR OF STOW LIMIT SWITCHES WITHIN THE PDU WILL ALLOW THE MECHANISM TO CONTINUE TO DRIVE TOWARDS THE STOW STATE UNTIL 1) THE STOW COMMAND SIGNAL IS REMOVED, 2) TORQUE LIMITER SETTINGS ARE REACHED, OR 3) STRUCTURAL FAILURE IS EXPERIENCED AT SOME POINT THE DRIVE TRAIN DOWNSTREAM OF THE TORQUE LIMITERS. PORT (STARBOARD) INDICATOR, DS5 (DS3) ON PANEL R13L WILL SHOW BARBERPOLE ALTHOUGH THE ASSOCIATED PAIR OF RADIATOR PANELS IS IN THE STOW STATE.

REFERENCES: VS70-590409; VS70-960099; SSSH DWG. NO 15.6

REPORT DATE 11/25/87

C-637

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/1R  
MDAC ID: 6211 ABORT: /NA

ITEM: DEPLOYMENT TORQUE SHAFT  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE  
(RUPTURE)

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT TORQUE SHAFT
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		
	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: V070-594412-001; V070-594420-001/002; V070-594480-005

CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

WITH A BROKEN/DISCONNECTED TORQUE SHAFT, OUTPUT OF THE PDU IS LOST TO ONE OR BOTH OF THE ROTARY ACTUATORS DEPENDENT UPON THE LOCATION OF THE BREAK. IF BOTH ACTUATORS AFFECTED, CAPABILITY TO DEPLOY/STOW THAT RADIATOR PANEL IS LOST. WITH A BINDING/JAMMED SHAFT SEGMENT, TORQUE LIMITERS WILL ACTIVATE AT THE PRESET LIMIT TO PREVENT MOTOR BURNOUT AND CAPABILITY TO DEPLOY/STOW THE AFFECTED PAIR OF RADIATOR PANELS (PORT, STARBOARD) IS LOST. IF UNABLE TO STO, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANELS DURING DEORBIT/ENTRY.

REFERENCES: V070-594400; SSSH DWG. NO. 14.1

REPORT DATE 11/25/87

C-638

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/3  
MDAC ID: 6212 ABORT: /NA

ITEM: DEPLOYMENT ROTARY ACTUATOR  
FAILURE MODE: STRUCTURAL FAILURE (RUPTURE), LOSS OF OUTPUT,  
STRIPPED TEETH/GEARS, BROKEN OUTPUT ARM

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT ROTARY ACTUATOR
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/NA		RTLS:	/NA
LIFTOFF:	/NA		TAL:	/NA
ONORBIT:	3/3		AOA:	/NA
DEORBIT:	3/3		ATO:	/NA
LANDING/SAFING:	/NA			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER: MC-147-00XX-000X

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
STRUCTURAL FAILURE

EFFECTS/RATIONALE:

IN THIS MODE PDU OUTPUT IS INTACT AND IS TRANSMITTED TO THE  
ROTARY ACTUATOR (IN TERMS OF EFFECTS, A BINDING/JAMMED ACTUATOR  
IS TREATED AS A FAILED DEPLOYMENT TORQUE SHAFT ASSEMBLY). DUE  
TO INTERNAL SLIPPAGE OR A BROKEN OUTPUT ARM, MOTION IS NOT OUTPUT  
TO THE ASSOCIATED DEPLOYMENT CRANK. THE REMAINING ACTUATOR  
SHOULD OPERATE NORMALLY TO DRIVE THE RADIATOR PANEL TO THE DEPLOY  
STATE. THE INDICATOR ON PANEL R13L WILL SHOW DEPLOY FOR THAT  
RADIATOR PAIR (PORT OR STARBOARD) ALTHOUGH ONE END OF ONE PANEL  
MAY NOT BE FULLY DEPLOYED.

REFERENCES: V070-594400; SSSH DWG. NO. 14.1

REPORT DATE 11/25/87

C-639

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87  
SUBSYSTEM: MECH/PBR  
MDAC ID: 6213

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /NA

ITEM: DEPLOYMENT CRANK AND LINK  
FAILURE MODE: FAILS TO DEPLOY/STOW, PHYSICAL BINDING/JAMMING,  
STRUCTURAL FAILURE (RUPTURE)

LEAD ANALYST: W.T. SLAUGHTER

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT CRANK AND LINK
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS  
PART NUMBER:

CAUSES:

EFFECTS/RATIONALE:

WORST CASE FAILURE OF A BROKEN/DISCONNECTED DEPLOYMENT CRANK OR LINK IS LOSS OF DEPLOYMENT MOTION/FORCE FOR ONE END OF ONE RADIATOR PANEL. THE REMAINING ROTARY ACTUATOR/DEPLOYMENT CRANK MECHANISM SHOULD DRIVE THE RADIATOR PANEL TO THE DEPLOY STATE. THE INDICATOR ON PANEL R13L WILL SHOW DEPLOY FOR THAT RADIATOR PAIR (PORT OR STARBOARD) ALTHOUGH ONE END OF ONE PANEL MAY NOT BE FULLY DEPLOYED.

REFERENCES: V070-594400; SSSH DWG. NO. 14.1

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/1R  
MDAC ID: 6301 ABORT: /NA

ITEM: HINGE FITTINGS/POINTS  
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR HINGES
- 4) HINGE FITTINGS/POINTS
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS/RADIATOR PANELS  
PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, TEMPERATURE, THERMAL SHOCK,  
DISTORTION/ELONGATION

EFFECTS/RATIONALE:

DISTORTION/WARP OF PLBD, RADIATOR PANELS, LONGERON SIL MAY OCCUR IN SUCH A MANNER AS TO CAUSE HINGES TO BIND OR JAM. WORSE CASE EFFECT OF A BINDING/JAMMED RADIATOR HINGE IS LOSS A THE CAPABILITY TO STOW A DEPLOYED RADIATOR PANEL. IF UNABLE TO STOW POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

REFERENCES: TBD

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR FLIGHT: 3/1R  
MDAC ID: 6302 ABORT: /NA

ITEM: HINGE FITTINGS/POINTS  
FAILURE MODE: STRUCTURAL FAILURE, FRACTURE

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR HINGES
- 4) HINGE FITTINGS/POINTS
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS/RADIATOR PANELS  
PART NUMBER: TBD

CAUSES: PIECE-PART FAILURE, STRUCTURAL FAILURE,  
DISTORTION/ELONGATION

EFFECTS/RATIONALE:

EFFECTS OF FRACTURED HINGE PARTS, SHEARED/MISSING HINGE PINS ARE  
NIL IF THE FAILURE IS ISOLATED TO A SINGLE HINGE/HINGE POINT.  
WORSE CASE EFFECT WOULD BE THE FAILURE OF TWO ADJACENT  
HINGES/HINGE POINTS WITH THE RADIATORS IN THE DEPLOY STATE  
IN WHICH CASE THE ABILITY TO STOW THE RADIATOR AND CLOSE THE PLBD  
MAY BE JEOPARDIZED.

REFERENCES: TBD

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/3  
MDAC ID: 6501 ABORT: /NA

ITEM: LATCH CONTROL SWITCH (S4/S6)  
FAILURE MODE: FAILS TO RELEASE, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- 4) LATCH CONTROL
- 5) CONTROL SWITCH (S4/S6)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/NA		RTLS:	/NA
LIFTOFF:	/NA		TAL:	/NA
ONORBIT:	3/3		AOA:	/NA
DEORBIT:	/NA		ATO:	/NA
LANDING/SAFING:	/NA			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R13L  
PART NUMBER: (S4/S6)

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

WITH SELECTION OF RELEASE POSITION ON SWITCHES S4 AND S6, EFFECT OF A SINGLE FAILURE IS TO PRECLUDE CONTROL POWER FROM BEING PASSED TO THE MMCA'S (TWO ASSOCIATED WITH EACH SWITCH) CAUSING LOSS OF SINGLE (REDUNDANT) MOTOR IN EACH LATCH POWER DRIVE UNIT WITH RELEASE FUNCTION OCCURRING IN SINGLE MOTOR DRIVE TIME (TWICE NORMAL). SECOND FAILURE IS LOSS OF CAPABILITY TO RELEASE RADIATORS WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. PARTIAL SWITCH FAILURE (CONTACT OPEN) RESULTS IN THE LOSS OF USE OF A RADIATOR PAIR (PORT OR STARBOARD) AND SHOULD NOT AFFECT MISSION CONTINUANCE.

REFERENCES: VS70-590409; SSSH DWG. NO. 15.6

REPORT DATE 11/25/87

C-643

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/3  
MDAC ID: 6502 ABORT: /NA

ITEM: LATCH CONTROL SWITCH (S4/S6)  
FAILURE MODE: FAILS IN RELEASE, FAILS TO SWITCH, SHORTED

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- 4) LATCH CONTROL
- 5) CONTROL SWITCH (S4/S6)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R13L  
PART NUMBER: (S4/S6)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, DEBRIS

EFFECTS/RATIONALE:

WITH DESELECTION OF RELEASE POSITION ON SWITCHES S4 AND S6, EFFECT OF A SHORT ACROSS A CONTACT PAIR IS TO ALLOW CONTINUOUS POWER TO BE APPLIED TO THE CONTROL UNIT OF A SINGLE, GATED RELAY DRIVER/RELAY. THE INVERTED "AND" SIGNAL AT THAT GATE WILL OPERATE AS NORMAL TO REMOVE THE POWER FROM THE RELAY DRIVER/RELAY WHEN THE PDU LIMIT SWITCH REACHES THE RELEASED STATE. RELEASE COMMAND SIGNAL SHOULD BE REMOVED WHEN PLB MECH PWR SYS1/SYS2 SWITCH (S1/S2) PLACED TO OFF.

REFERENCES: VS70-590409; SSSH DWG. NO. 15.6

REPORT DATE 11/25/87

C-644



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/1R  
MDAC ID: 6503 ABORT: /NA

ITEM: LATCH CONTROL SWITCH (S4/S6)  
FAILURE MODE: FAILS TO LATCH, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- 4) LATCH CONTROL
- 5) CONTROL SWITCH (S4/S6)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL R13L  
PART NUMBER: (S4/S6)

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

WITH SELECTION OF LATCH POSITION ON SWITCHES S4 AND S6, EFFECT OF A SINGLE FAILURE IS TO PRECLUDE CONTROL POWER FROM BEING PASSED TO THE MMCA'S (TWO ASSOCIATED WITH EACH SWITCH) CAUSING LOSS OF SINGLE (REDUNDANT) MOTOR IN EACH LATCH POWER DRIVE UNIT WITH LATCH FUNCTION OCCURING IN SINGLE MOTOR DRIVE TIME (TWICE NORMAL). SECOND FAILURE IS LOSS OF CAPABILITY TO LATCH RADIATORS. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL(S) DURING DEORBIT/ENTRY.

REFERENCES: VS70-590409; SSSH DWG. NO. 15.6

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/3  
MDAC ID: 6504 ABORT: /NA

ITEM: LATCH CONTROL SWITCH (S4/S6)  
FAILURE MODE: FAILS IN LATCH, FAILS TO SWITCH, SHORTED

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- 4) LATCH CONTROL
- 5) CONTROL SWITCH (S4/S6)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: R13L  
PART NUMBER: (S4/S6)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, DEBRIS

EFFECTS/RATIONALE:

WITH DESELECTION OF LATCH POSITION ON SWITCHES S4 AND S6, EFFECT OF A SHORT ACROSS A CONTACT PAIR IS TO ALLOW CONTINUOUS POWER TO BE APPLIED TO THE CONTROL INPUT OF A SINGLE, GATED RELAY DRIVER/RELAY. THE INVERTED "AND" SIGNAL AT THAT GATE OPERATE AS NORMAL TO REMOVE THE POWER FROM THE RELAY DRIVER/RELAY WHEN THE PDU LIMIT SWITCH REACHES THE LATCH STATE. LATCH COMMAND SIGNAL SHOULD BE REMOVED WHEN PLB MECH PWR SYS1/SYS2 SWITCH (S1/S2) PLACED TO OFF.

REFERENCES: VS70-590409; SSSH DWG. NO. 15.6

REPORT DATE 11/25/87

C-646

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/3  
MDAC ID: 6507 ABORT: /NA

ITEM: RADIATOR CONTROL SWITCH (S5/S7)  
FAILURE MODE: FAILS TO DEPLOY, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- 4) RADIATOR CONTROL
- 5) CONTROL SWITCH (S5/S7)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/NA		RTLS:	/NA
LIFTOFF:	/NA		TAL:	/NA
ONORBIT:	3/3		AOA:	/NA
DEORBIT:	/NA		ATO:	/NA
LANDING/SAFING:	/NA			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R13L  
PART NUMBER: (S5/S7)

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

WITH SELECTION OF DEPLOY POSITION ON SWITCHES S5 AND S7, EFFECT OF A SINGLE FAILURE IS TO PRECLUDE CONTROL POWER FROM BEING PASSED TO THE MMCA'S (TWO ASSOCIATED WITH EACH SWITCH) CAUSING LOSS OF SINGLE (REDUNDANT) MOTOR IN EACH DEPLOYMENT POWER DRIVE UNIT WITH DEPLOY FUNCTION OCCURRING IN SINGLE MOTOR DRIVE TIME (TWICE NORMAL). SECOND FAILURE IS LOSS OF CAPABILITY TO DEPLOY RADIATORS WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. PARTIAL SWITCH FAILURE (CONTACT OPEN) RESULTS IN LOSS OF USE OF A RADIATOR PAIR (PORT OR STARBARD) AND SHOULD NOT AFFECT MISSION CONTINUANCE.

REFERENCES: VS70-590409; SSSH DWG. NO. 15.6

REPORT DATE 11/25/87

C-647

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/3  
MDAC ID: 6508 ABORT: /NA

ITEM: RADIATOR CONTROL SWITCH (S5/S7)  
FAILURE MODE: FAILS IN DEPLOY, FAILS TO SWITCH, SHORTED

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- 4) RADIATOR CONTROL
- 5) CONTROL SWITCH (S5/S7)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R13L  
PART NUMBER: (S5/S7)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, DEBRIS

EFFECTS/RATIONALE:

WITH DESELECTION OF DEPLOY POSITION ON SWITCHES S5 AND S7, EFFECT OF A SHORT ACROSS A CONTACT PAIR IS TO ALLOW CONTINUOUS POWER TO BE APPLIED TO THE CONTROL INPUT OF A SINGLE, GATED RELAY DRIVER/RELAY. THE INVERTED "AND" SIGNAL AT THAT GATE WILL OPERATE AS NORMAL TO REMOVE THE POWER FROM THE RELAY DRIVER/RELAY WHEN THE PDU LIMIT SWITCH REACHES THE DEPLOYED STATE. DEPLOY COMMAND SIGNAL SHOULD BE REMOVED WHEN PLB MECH PWR SYS1/SYS2 SWITCH (S1/S2) PLACED TO OFF.

REFERENCES: VS70-590409; SSSH DWG. NO. 15.6

REPORT DATE 11/25/87

C-648

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/1R  
MDAC ID: 6509 ABORT: /NA

ITEM: RADIATOR CONTROL SWITCH (S5/S7)  
FAILURE MODE: FAILS TO STOW, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- 4) RADIATOR CONTROL
- 5) CONTROL SWITCH (S5/S7)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/NA		RTLS:	/NA
LIFTOFF:	/NA		TAL:	/NA
ONORBIT:	3/3		AOA:	/NA
DEORBIT:	3/1R		ATO:	/NA
LANDING/SAFING:	/NA			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL R13L  
PART NUMBER: (S5/S7)

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

WITH SELECTION OF STOW POSITION ON SWITCHES S5 AND S7, EFFECT OF A SINGLE FAILURE IS TO PRECLUDE CONTROL POWER FROM BEING PASSED TO THE MMCA'S (TWO ASSOCIATED WITH EACH SWITCH) CAUSING LOSS OF SINGLE (REDUNDANT) MOTOR IN EACH DEPLOYMENT POWER DRIVE UNIT WITH STOW FUNCTION OCCURRING IN SINGLE MOTOR DRIVE TIME (TWICE NORMAL). SECOND FAILURE IS LOSS OF CAPABILITY TO STOW RADIATORS REQUIRING CREW EVA TO MECHANICALLY DISCONNECT AND STOW RADIATOR PANELS. DEPLOYED RADIATORS INTERFERE WITH PLBD CLOSURE WHICH MAY RESULT IN LOSS OF VEHICLE AND CREW.

REFERENCES: VS70-590409; SSSH DWG. NO. 15.6

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/3  
MDAC ID: 6510 ABORT: /NA

ITEM: RADIATOR CONTROL SWITCH (S5/S7)  
FAILURE MODE: FAILS IN STOW, FAILS TO SWITCH, SHORTED

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- 4) RADIATOR CONTROL
- 5) CONTROL SWITCH (S5/S7)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R13L  
PART NUMBER: (S5/S7)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, DEBIRS

EFFECTS/RATIONALE:

WITH DESELECTION OF STOW POSITION ON SWITCHES S5 AND S7, EFFECT OF A SHORT ACROSS A CONTACT PAIR IS TO ALLOW CONTINUOUS POWER TO BE APPLIED TO THE CONTROL INPUT OF A SINGLE, GATED RELAY DRIVER/RELAY. THE INVERTED "AND" SIGNAL AT THAT GATE WILL OPERATE AS NORMAL TO REMOVE THE POWER FROM THE RELAY DRIVER/RELAY WHEN THE PDU LIMIT SWITCH REACHES THE STOWED STATE. STOW COMMAND SIGNAL SHOULD BE REMOVED WHEN PLB MECH PWR SYS1/SYS2 SWITCH (S1/S2) PLACED TO OFF.

REFERENCES: VS70-590409; SSSH DWG. NO. 15.6

REPORT DATE 11/25/87

C-650

C.7

PERSONNEL HATCH ANALYSIS WORKSHEETS

# PERSONNEL HATCH ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT	ABORT	SCREENS			
	H/F	H/F	A	B	C	
-----	-----	-----	-----	-----	-----	-----
7100 *	3/1R	/NA	P	F	P	PRESSURE PORT
7101 *	1/1	/NA				PRESSURE PORT
7102 *	3/1R	/NA	P	F	P	O RING
7103 *	3/1R	/NA	P	F	P	O RING
7104 *	3/1R	/NA	P	F	P	VIEWPORT
7105	3/1R	/NA	P	P	P	VIEWPORT
7106 *	3/1R	/NA	P	F	P	ACTUATOR
7107 *	3/1R	/NA	P	F	P	ACTUATOR
7108 *	3/1R	/NA	P	F	P	ACTUATOR
7109 *	3/2R	/NA	P	F	P	ACTUATOR
7110 *	3/2R	/NA	P	F	P	ACTUATOR
7111 *	3/2R	/NA	P	F	P	ACTUATOR
7112 *	3/1R	/NA	P	F	P	O RING
7113 *	3/1R	/NA	P	F	P	O RING
7114 *	3/1R	/NA	P	F	P	VIEWPORT
7115	3/1R	/NA	P	P	P	VIEWPORT
7116	3/3	/NA				VIEWPORT LATCH
7117	3/3	/NA				VIEWPORT LATCH
7118	3/3	3/3				BOOT
7119	3/3	3/3				DRAIN TUBING
7120	3/3	3/3				DRAIN TUBING

(\*) Potential Critical Items.



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7100

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: PRESSURE PORT  
FAILURE MODE: CLOGGED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) AIRLOCK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.AL.1

CAUSES: DEBRIS IN PORT

EFFECTS/RATIONALE:

AIRLOCK PRESSURE MAY NOT BE ABLE TO EQUALIZE WITH PAYLOAD BAY AND/OR MIDDECK. THIS COULD CAUSE THE AIRLOCK HATCH B TO NOT OPEN BECAUSE OF HIGHER PRESSURE INSIDE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7101

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 1/1  
ABORT: /

ITEM: PRESSURE PORT  
FAILURE MODE: LEAKAGE

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) AIRLOCK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MIDDECK  
PART NUMBER: MA.AL.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ATMOSPHERE LEAKAGE THROUGH THE PRESSURE PORT COULD CAUSE LOSS OF LIFE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7102

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: O RING  
FAILURE MODE: LEAKAGE

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) AIRLOCK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.AL.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
ATMOSPHERE LEAKAGE THROUGH THE O RING COULD CAUSE LOSS OF LIFE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7103

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: O RING  
FAILURE MODE: CRACKED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) AIRLOCK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.AL.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

A CRACKED O RING COULD CAUSE LEAKAGE OF ATMOSPHERE THROUGH THE O RING. THIS COULD CAUSE LOSS OF LIFE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7104

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: VIEWPORT  
FAILURE MODE: LEAKAGE

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) AIRLOCK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	/		RTLS:	/
LIFTOFF:	/		TAL:	/
ONORBIT:	3/1R		AOA:	/
DEORBIT:	/		ATO:	/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.AL.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ATMOSPHERE LEAKAGE THROUGH THE VIEWPORT COULD CAUSE LOSS OF LIFE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7105

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: VIEWPORT  
FAILURE MODE: CRACKED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) AIRLOCK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.AL.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ATMOSPHERE LEAKAGE THROUGH THE VIEWPOINT COULD CAUSE LOSS OF LIFE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7106

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: ACTUATOR  
FAILURE MODE: BROKEN GEAR

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) AIRLOCK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.AL.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

A BROKEN ACTUATOR WOULD PREVENT OPENING OF THE AIRLOCK. THIS  
COULD PREVENT AN EVA TO CLOSE THE PAYLOAD BAY DOORS, ETC.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7107

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: ACTUATOR  
FAILURE MODE: BROKEN SHAFT

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) AIRLOCK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.AL.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

A BROKEN ACTUATOR WOULD PREVENT OPENING OF THE AIRLOCK. THIS  
COULD PREVENT AN EVA TO CLOSE THE PAYLOAD BAY DOORS, ETC.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7108

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: ACTUATOR  
FAILURE MODE: JAMMED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) AIRLOCK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.AL.4

CAUSES: DEBRIS IN ACTUATOR

EFFECTS/RATIONALE:

A JAMMED ACTUATOR WOULD PREVENT OPENING OF THE AIRLOCK. THIS  
COULD PREVENT AN EVA TO CLOSE THE PAYLOAD BAY DOORS, ETC.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7109

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: ACTUATOR  
FAILURE MODE: BROKEN GEAR

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT		HDW/FUNC
PRELAUNCH:	3/2R	RTLS:		/
LIFTOFF:	/	TAL:		/
ONORBIT:	/	AOA:		/
DEORBIT:	/	ATO:		/
LANDING/SAFING:	/			

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

A BROKEN ACTUATOR DURING PRELAUNCH COULD CAUSE LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7110

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: ACTUATOR  
FAILURE MODE: BROKEN SHAFT

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

A BROKEN ACTUATOR DURING PRELAUNCH COULD CAUSE LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7111

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/2R  
ABORT: /

ITEM: ACTUATOR  
FAILURE MODE: JAMMED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.1

CAUSES: DEBIR IN ACTUATOR

EFFECTS/RATIONALE:

A JAMMED ACTUATOR DURING PRELAUNCH COULD CAUSE LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7112

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: O RING  
FAILURE MODE: CRACKED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

A CRACKED O RING COULD CAUSE LEAKAGE OF ATMOSPHERE THROUGH THE O RING. THIS COULD CAUSE LOSS OF LIFE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7113

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: O RING  
FAILURE MODE: LEAKAGE

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
ATMOSPHERE LEAKAGE THROUGH THE O RING COULD CAUSE LOSS OF FIRE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7114

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: VIEWPORT  
FAILURE MODE: LEAKAGE

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ATMOSPHERE LEAKAGE THROUGH THE VIEWPORT COULD CAUSE THE LOSS OF LIFE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7115

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/1R  
ABORT: /

ITEM: VIEWPORT  
FAILURE MODE: CRACKED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ATMOSPHERE LEAKAGE THROUGH THE VIEWPORT COULD CAUSE THE LOSS OF LIFE.

REFERENCES:



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7116

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: VIEWPORT LATCH  
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
WILL NOT BE ABLE TO LATCH THE VIEWPORT COVER CLOSED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7117

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: /

ITEM: VIEWPORT LATCH  
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

WILL NOT BE ABLE TO UNLATCH THE VIEWPORT COVER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7118

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: BOOT  
FAILURE MODE: LEAKAGE

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4) ATTENUATOR
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.AT.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
NO EFFECT. THIS FAILURE DOES NOT AFFECT HATCH OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/PH  
MDAC ID: 7119

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 3/3  
ABORT: 3/3

ITEM: DRAIN TUBING  
FAILURE MODE: LEAKAGE

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4) ATTENUATOR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.AT.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT. THIS FAILURE DOES NOT AFFECT HATCH OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/PH FLIGHT: 3/3  
MDAC ID: 7120 ABORT: 3/3

ITEM: DRAIN TUBING  
FAILURE MODE: CLOGGED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PERSONNEL HATCHES
- 3) SIDE HATCH
- 4) ATTENUATOR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MIDDECK  
PART NUMBER: MA.SH.AT.1

CAUSES: DEBRIS IN DRAIN TUBING

EFFECTS/RATIONALE:  
NO EFFECT. THIS FAILURE DOES NOT AFFECT HATCH OPERATION.

REFERENCES:

C.8

VENT DOOR MECHANISM ANALYSIS WORKSHEETS

# VENT DOOR MECHANISM ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT H/F	ABORT H/F	SCREENS A B C			
8100 *	2/1R	2/1R	P	N	P	ROD ASSEMBLY
8101 *	2/1R	2/1R	P	N	P	BELLCRANK
8102 *	2/1R	2/1R	P	N	P	BOLT/BRACKET/DOUBLER
8103 *	2/1R	2/1R	P	N	P	INPUT/OUTPUT TORQUE SHAFT
8104 *	2/1R	2/1R	P	N	P	INPUT/OUTPUT TORQUE SHAFT
8105 *	2/1R	2/1R	P	N	P	DIFFERENTIAL/GEAR TRAIN ASSY
8106 *	2/1R	2/1R	P	N	P	DIFFERENTIAL/GEAR TRAIN ASSY
8107 *	2/1R	2/1R	P	N	P	MICROSWITCH POSITION INDICATOR
8108 *	2/1R	2/1R	P	N	P	MICROSWITCH POSITION INDICATOR
8109	3/3	3/3				ALL ITEMS NOT SHOWN ON MDAC ID
8501 *	2/1R	2/1R	P	N	P	ACTUATOR MOTOR
8502 *	2/1R	2/1R	P	N	P	ACTUATOR SWITCH MODULE
8503 *	2/1R	2/1R	P	N	P	MCA AC POWER RELAY
8504 *	2/1R	2/1R	P	N	P	MCA PURGE SIGNAL DRIVER
8505 *	2/1R	2/1R	P	N	P	MCA DC POWER BUS
8506 *	2/1R	2/1R	P	N	P	MCA AC POWER BUS
8507 *	2/1R	2/1R	P	N	P	MCA DIODE
8508 *	2/1R	2/1R	P	N	P	MCA DIODE
8509 *	2/1R	2/1R	P	N	P	ELECTRICAL CONNECTORS/PINS
8510 *	2/1R	2/1R	P	N	P	CABLES/WIRING
8511 *	2/1R	2/1R	P	N	P	MODULATOR/DEMODULATOR
8512 *	2/1R	2/1R	P	N	P	MODULATOR/DEMODULATOR
8513 *	2/1R	2/1R	P	N	P	GPC SOFTWARE
8514 *	2/1R	2/1R	P	N	P	FUSE
8515 *	2/1R	2/1R	P	N	P	RESISTOR
8516 *	2/1R	2/1R	P	N	P	RESISTOR
8517 *	2/1R	2/1R	P	N	P	GPC SOFTWARE

(\*) Potential Critical Items.

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM FLIGHT: 2/1R  
MDAC ID: 8100 ABORT: 2/1R

ITEM: ROD ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE INOPERABLE,  
DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) ROD ASSEMBLY
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR  
PART NUMBER: V070-592511-001/2, 5512-007/8, ME162-0024-001/2,  
(TBD)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS  
BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

REFERENCES: V070-592501,4501,381031,4031,5031,5300, SSSH DWG.  
NO. 15.1 SHEET 1-3, (TBD)

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM FLIGHT: 2/1R  
MDAC ID: 8101 ABORT: 2/1R

ITEM: BELLCRANK  
FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE INOPERABLE,  
BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) BELLCRANK
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR  
PART NUMBER: V070-594505/6-001, 11/2-001, (TBD)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS  
BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

REFERENCES: V070-592501, 4501, 381031, 4031, 5031, 5300, SSSH DWG.  
NO. 15.1 SHEET 1-3, (TBD)

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87  
SUBSYSTEM: MECH/VDM  
MDAC ID: 8102

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: BOLT/BRACKET/DOUBLER  
FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE INOPERABLE,  
BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) BOLT/BRACKET/DOUBLER
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: NEAR DOOR  
PART NUMBER: NAS1004-16/18/22, V070-384318-002, 5328-002, 595528,  
V070-385311/2-001/2, (TBD)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:  
LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS  
BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

REFERENCES: V070-592501, 4501, 381031, 4031, 5031, 5300, SSSH DWG.  
NO. 15.1 SHEET 1-3, (TBD)

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM FLIGHT: 2/1R  
MDAC ID: 8103 ABORT: 2/1R

ITEM: INPUT/OUTPUT TORQUE SHAFT - HOUSING  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) INPUT/OUTPUT TORQUE SHAFT - HOUSING
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: NEAR DOOR  
PART NUMBER: MC147-0008/9-004-6, V070-594504/7-001/2, 2503/13-001/2, (TBD)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE, THERMAL SHOCK, ACCELERATION, VIBRATION

EFFECTS/RATIONALE:  
LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

REFERENCES: V070-592501, 4501, 381031, 4031, 5031, 5300, SSSH DWG. NO. 15.1 SHEET 1-3, (TBD)

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM FLIGHT: 2/1R  
MDAC ID: 8104 ABORT: 2/1R

ITEM: INPUT/OUTPUT TORQUE SHAFT - HOUSING  
FAILURE MODE: FAILS TO START/STOP AS COMMANDED AND ROTATES  
FREELY

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) INPUT/OUTPUT TORQUE SHAFT - HOUSING
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR  
PART NUMBER: MC147-0008/9-004-6, V070-594504/7-001/2, 2503/13-  
001/2, (TBD)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE,  
THERMAL SHOCK, ACCELERATION, VIBRATION

EFFECTS/RATIONALE:  
LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS  
BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

REFERENCES: V070-592501, 4501, 381031, 4031, 5031, 5300, SSSH DWG.  
NO. 15.1 SHEET 1-3, (TBD)

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM FLIGHT: 2/1R  
MDAC ID: 8105 ABORT: 2/1R

ITEM: DIFFERENTIAL/GEAR TRAIN ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) DIFFERENTIAL/GEAR TRAIN ASSEMBLY
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES		HDW/FUNC
	HDW/FUNC	ABORT	
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR  
PART NUMBER: MC147-0008/9-004-6, V070-594504/7-001/2, 2503/13-001/2, (TBD)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, STRUCTURAL FAILURE, JAMMED, FRACTURE

EFFECTS/RATIONALE:  
LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS  
BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

REFERENCES: V070-592501, 4501, 381031, 4031, 5031, 5300, SSSH DWG.  
NO. 15.1 SHEET 1-3, (TBD)

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM FLIGHT: 2/1R  
MDAC ID: 8106 ABORT: 2/1R

ITEM: DIFFERENTIAL/GEAR TRAIN ASSEMBLY  
FAILURE MODE: FAILS TO REMAIN IN POSITION, FREELY ROTATES

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) DIFFERENTIAL/GEAR TRAIN ASSEMBLY
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR  
PART NUMBER: MC147-0008/9-004-6, V070-594504/7-001/2, 2503/13-001/2, (TBD)

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
STRUCTURAL FAILURE, VIBRATION

EFFECTS/RATIONALE:  
LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS  
BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

REFERENCES: V070-592501,4501,381031,4031,5031,5300, SSSH DWG.  
NO. 15.1 SHEET 1-3, (TBD)

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM FLIGHT: 2/1R  
MDAC ID: 8107 ABORT: 2/1R

ITEM: MICROSWITCH POSITION INDICATOR, ACTUATOR  
FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE  
OPERATION

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MICROSWITCH POSITION INDICATOR, ACTUATOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR  
PART NUMBER: MC147-0008/9-004-6, (TBD)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, THERMAL  
SHOCK, VIBRATION, INADVERTENT OPERATION/ACTIVATION

EFFECTS/RATIONALE:  
LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS  
BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

REFERENCES: V070-592501, 4501, 381031, 4031, 5031, 5300, SSSH DWG.  
NO. 15.1 SHEET 1-3, (TBD)

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM FLIGHT: 2/1R  
MDAC ID: 8108 ABORT: 2/1R

ITEM: MICROSWITCH POSITION INDICATOR, ACTUATOR  
FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, PREMATURE  
OPERATION, OPEN (ELECTRICAL)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MICROSWITCH POSITION INDICATOR, ACTUATOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR  
PART NUMBER: MC147-0008/9-004-6, (TBD)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, THERMAL  
SHOCK, VIBRATION, INADVERTENT OPERATION/ACTIVATION

EFFECTS/RATIONALE:  
LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS  
BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

REFERENCES: V070-592501, 4501, 381031, 4031, 5031, 5300, SSSH DWG.  
NO. 15.1 SHEET 1-3, (TBD)



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM FLIGHT: 3/3  
MDAC ID: 8109 ABORT: 3/3

ITEM: ALL ITEMS NOT SHOWN ON MDAC ID 8100 - 8108  
FAILURE MODE: ALL FAILURE MODES

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) ALL REMAINING PARTS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: NEAR DOOR  
PART NUMBER: ALL PARTS NOT SHOWN ON MDAC ID 8100 - 8108

CAUSES: ALL CAUSES

EFFECTS/RATIONALE:

FAILURE OF ALL PARTS NOT SHOWN ON MDAC ID 8100 -8108 WILL HAVE NO  
EFFECT ON MISSION, VEHICLE OR CREW.

REFERENCES: V070-592501,4501,381031,4031,5031,5300, SSSH DWG.  
NO. 15.1 SHEET 1-3, (TBD)

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87  
SUBSYSTEM: MECH/VDM/EPD&C  
MDAC ID: 8501

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: ACTUATOR MOTOR  
FAILURE MODE: PREMATURE OPERATION, DELAYED OPERATION, OPEN  
(ELECTRICAL), SHORTED, FAILS TO START/STOP

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) ELECTROMECHANICAL ACTUATOR
- 4) ACTUATOR MOTOR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: INSIDE ACTUATOR ASSEMBLY, NEAR VENT DOOR  
PART NUMBER: 10V59A(XX)

CAUSES: ERRONEOUS INPUT, MECHANICAL SHOCK, OVERLOAD, PIECE-PART  
FAILURE, PARTIAL INPUT, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE  
TO INABILITY OF ACTUATOR MOTOR TO MOVE VENT DOOR TO REQUIRED  
POSITION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND  
PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS  
GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL.  
COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO  
CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR  
ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-  
ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC  
12770 VOL. 10B

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8502 ABORT: 2/1R

ITEM: ACTUATOR SWITCH MODULE  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, FAILS TO  
SWITCH, SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) ELECTROMECHANICAL ACTUATOR
- 4) ACTUATOR SWITCH MODULE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	2/1R		RTLS:	3/3
LIFTOFF:	2/1R		TAL:	3/3
ONORBIT:	3/3		AOA:	2/1R
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: INSIDE ACTUATOR ASSEMBLY, NEAR VENT DOOR  
PART NUMBER: TBD

CAUSES: ERRONEOUS INPUT, MECHANICAL SHOCK, OVERLOAD, PIECE-PART  
FAILURE, PARTIAL INPUT, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE  
TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P  
COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR  
EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH  
DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A  
TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS  
DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE  
TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC  
12770 VOL. 10B

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8503 ABORT: 2/1R

ITEM: MCA AC POWER RELAY  
FAILURE MODE: PARTIAL OUTPUT, OPEN (ELECTRICAL), LOSS OF OUTPUT,  
FAILS TO SWITCH, SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- 4) AC POWER RELAY
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY  
PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, PARTIAL  
INPUT, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE  
TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P MAY  
CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR  
EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH  
DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A  
TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS  
DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE  
TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC  
12770 VOL. 10B

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8504 ABORT: 2/1R

ITEM: MCA PURGE SIGNAL DRIVER  
FAILURE MODE: ERRONEOUS OUTPUT, OPEN (ELECTRICAL), LOSS OF  
OUTPUT, SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- 4) PURGE SIGNAL DRIVER
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY  
PART NUMBER: REFERENCE DESIGNATOR - AR(XX)-TYPE 1

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
TEMPERATURE, PARTIAL INPUT, ELECTROMAGNETIC FIELDS, LOSS OF  
INPUT, VIBRATION

EFFECTS/RATIONALE:  
POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GASES (H2) DURING  
PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A  
TOXIC/EXPLOSIVE GAS ENVIRONMENT.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC  
12770 VOL. 10B

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8505 ABORT: 2/1R

ITEM: MCA DC POWER BUS  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- 4) DC POWER BUS
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY  
PART NUMBER: REFERENCE DESIGNATOR - DC-A, B, C

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8506 ABORT: 2/1R

ITEM: MCA AC POWER BUS  
FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- 4) AC POWER BUS (3-PHASE)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY  
PART NUMBER: REFERENCE DESIGNATOR - AC-1, AC-2, AC-3

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, PARTIAL INPUT, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

REPORT DATE 11/25/87 C-691

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87  
SUBSYSTEM: MECH/VDM/EPD&C  
MDAC ID: 8507

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: MCA DIODE  
FAILURE MODE: OPEN (ELECTRICAL)

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- 4) DIODE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY  
PART NUMBER: REFERENCE DESIGNATOR - A1CR(XX)

CAUSES: OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK

EFFECTS/RATIONALE:

INABILITY TO CLOSE VENT DOOR DUE TO LOSS OF "CLOSE" COMMAND  
SIGNAL TO ACTUATOR MOTOR RELAY LOGIC GATE. LOSS OF  
PRESSURE/ACOUSTICS CONTROL DUE TO INABILITY TO CLOSE VENT DOORS.  
EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE.  
POTENTIAL FOR ACOUSTIC DAMAGE TO PAYLOADS. POTENTIAL FOR  
ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-  
ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC  
12770 VOL. 10B

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8508 ABORT: 2/1R

ITEM: MCA DIODE  
FAILURE MODE: SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- 4) DIODE
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	HDW/FUNC	CRITICALITIES	ABORT	HDW/FUNC
PRELAUNCH:	2/1R		RTLS:	3/3
LIFTOFF:	2/1R		TAL:	3/3
ONORBIT:	3/3		AOA:	2/1R
DEORBIT:	2/1R		ATO:	2/1R
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY  
PART NUMBER: REFERENCE DESIGNATOR - A1CR(XX)

CAUSES:

EFFECTS/RATIONALE:

A SHORTED DIODE COULD CAUSE DAMAGE TO MDM "CLOSE" COMMAND OUTPUT CIRCUITRY AND SHORT "PURGE" COMMAND SIGNAL, CAUSING LOSS OF MCA RELAY CONTROL DURING CLOSE OR PURGE CYCLES. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GASES (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

REPORT DATE 11/25/87

C-693

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8509 ABORT: 2/1R

ITEM: ELECTRICAL CONNECTORS/PINS  
FAILURE MODE: OPEN (ELECTRICAL), SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) ELECTRICAL CONNECTORS/PINS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	2/1R	RTLS:	3/3	
LIFTOFF:	2/1R	TAL:	3/3	
ONORBIT:	3/3	AOA:	2/1R	
DEORBIT:	2/1R	ATO:	2/1R	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: FROM MDMs TO VENT DOOR ACTUATOR MOTORS  
PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE,  
THERMAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P MAY CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

REPORT DATE 11/25/87

C-694

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8510 ABORT: 2/1R

ITEM: CABLES/WIRING  
FAILURE MODE: OPEN (ELECTRICAL), SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) CABLES/WIRING
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: FROM MDMs TO VENT DOOR ACTUATOR MOTORS  
PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,  
TEMPERATURE, THERMAL SHOCK, ELECTROMAGNETIC FIELDS, VIBRATION

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P MAY CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

REPORT DATE 11/25/87

C-695

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8511 ABORT: 2/1R

ITEM: MODULATOR/DEMODULATOR (2)  
FAILURE MODE: DELAYED OPERATION, PARTIAL OUTPUT, LOSS OF OUTPUT

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MODULATOR/DEMODULATOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: DATA PROCESSING SYSTEM  
PART NUMBER: MC615-0004-5100, MC615-0004-5200

CAUSES: ERRONEOUS INPUT, OVERLOAD, PIECE-PART FAILURE,  
TEMPERATURE, THERMAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P MAY CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

REPORT DATE 11/25/87

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INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8512 ABORT: 2/1R

ITEM: MODULATOR/DEMODULATOR  
FAILURE MODE: INADVERTENT OPERATION, PREMATURE OPERATION

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MODULATOR/DEMODULATOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: DATA PROCESSING SYSTEM  
PART NUMBER: MC615-0004-5100, MC615-0004-5200

CAUSES: ERRONEOUS INPUT, PIECE-PART FAILURE, ELECTROMAGNETIC  
FIELDS, INADVERTENT OPERATION/ACTIVATION, PARTIAL INPUT

EFFECTS/RATIONALE:

POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DUE TO  
PREMATURE VENT OPENING DURING PRELAUNCH. COULD CAUSE  
TOXIC/EXPLOSIVE GAS ENVIRONMENT. INADVERTENT OPENING OF VENT  
DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD  
DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC  
12770 VOL. 10B

REPORT DATE 11/25/87

C-697

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8513 ABORT: 2/1R

ITEM: GPC SOFTWARE  
FAILURE MODE: INADVERTENT OPERATION, PREMATURE OPERATION

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) GENERAL PURPOSE COMPUTER
- 4) VENT DOOR CONTROL SOFTWARE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: GPCS - DATA PROCESSING SYSTEM  
PART NUMBER: N/A

CAUSES: ERRONEOUS INPUT, PARTIAL INPUT, INADVERTENT  
OPERATION/ACTIVATION, ELECTROMAGNETIC FIELDS

EFFECTS/RATIONALE:

POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING  
PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE AN  
EXPLOSIVE/TOXIC GAS ENVIRONMENT. INADVERTENT OPENING OF VENT  
DORRS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD  
DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC  
12770 VOL. 10B

REPORT DATE 11/25/87

C-698

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87  
SUBSYSTEM: MECH/VDM/EPD&C  
MDAC ID: 8514

HIGHEST CRITICALITY HDW/FUNC  
FLIGHT: 2/1R  
ABORT: 2/1R

ITEM: FUSE  
FAILURE MODE: OPEN (ELECTRICAL)

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MOTOR CONTROL ASSEMBLY
- 4) FUSE
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC	ABORT
PRELAUNCH:	2/1R	RTLS: 3/3
LIFTOFF:	2/1R	TAL: 3/3
ONORBIT:	3/3	AOA: 2/1R
DEORBIT:	2/1R	ATO: 2/1R
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY  
PART NUMBER: REFERENCE DESIGNATORS - F1, F5

CAUSES: OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK

EFFECTS/RATIONALE:

AN OPEN FUSE WOULD CAUSE LOSS OF MCA RELAY CONTROL, CAUSING LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR HAZARODUS GAS (H2) BUILDUP DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CAUSE TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

REPORT DATE 11/25/87

C-699

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8515 ABORT: 2/1R

ITEM: RESISTOR  
FAILURE MODE: SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MOTOR CONTROL ASSEMBLY
- 4) RESISTOR
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY  
PART NUMBER: REFERENCE DESIGNATORS - A1R(X)

CAUSES: OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK

EFFECTS/RATIONALE:

A SHORTED RESISTOR COULD CAUSE DAMAGE TO MDM DOOR POSITION MONITOR CIRCUITRY AND/OR MCA RELAY LOGIC CIRCUITRY, CAUSING LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CAUSE TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

REPORT DATE 11/25/87 C-700



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8516 ABORT: 2/1R

ITEM: RESISTOR  
FAILURE MODE: OPEN (ELECTRICAL)

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MOTOR CONTROL ASSEMBLY
- 4) RESISTOR
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY  
PART NUMBER: REFERENCE DESIGNATORS - A1R(X)

CAUSES: OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK

EFFECTS/RATIONALE:

AN OPEN RESISTOR WOULD CAUSE LOSS OF ANY ACTUATOR MOTOR MICROSWITCH POSITION FEEDBACK SIGNAL TO MDMs AND MCA RELAY LOGIC CIRCUIT, CAUSING LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS, DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CAUSE TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

REPORT DATE 11/25/87

C-701

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R  
MDAC ID: 8517 ABORT: 2/1R

ITEM: GPC SOFTWARE  
FAILURE MODE: DELAYED OPERATION, ERRONEOUS OUTPUT, LOSS OF  
OUTPUT

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) GENERAL PURPOSE COMPUTER
- 4) VENT DOOR CONTROL SOFTWARE
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ NA ] C [ P ]

LOCATION: GPCS - DATA PROCESSING SYSTEM  
PART NUMBER: N/A

CAUSES: LOSS OF INPUT, ERRONEOUS INPUT, PARTIAL INPUT, PIECE-  
PART FAILURE

EFFECTS/RATIONALE:

POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING  
PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE AN  
EXPLOSIVE/TOXIC GAS ENVIRONMENT. LOSS OF PRESSURE CONTROL DURING  
TRANSIENT PRESSURE CONDITIONS, DUE TO INABILITY TO CONTROL VENT  
DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL  
AND PAYLOAD DAMAGE. INABILITY TO CLOSE VENT DOORS DURING RE-  
ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL  
ENVIRONMENT DURING RE-ENTRY.

REFERENCES: JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

REPORT DATE 11/25/87

C-702

C.9

STARTRACKER DOOR ANALYSIS WORKSHEETS

# STARTRACKER DOOR ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITICALITY		REDUNDANCY			ITEM NAME
	FLIGHT	ABORT	SCREENS			
	H/F	H/F	A	B	C	
9100	3/1R	3/3	P	P	P	INPUT/OUTPUT SHAFT - HOUSING
9101	3/1R	3/3	P	P	P	INPUT/OUTPUT SHAFT - HOUSING
9102	3/1R	3/3	P	P	P	OPEN LIMIT SWITCHES (S1 & S3)
9103	3/3	3/3				STOW LIMIT SWITCHES (S1 & S3)
9104	3/3	3/3				DEPLOY LIMIT SWITCHES (S2 & S4)
9105	3/3	3/3				DEPLOY LIMIT SWITCHES (S2 & S4)
9106	3/1R	3/3	P	P	P	GEAR TRAIN ASSEMBLY
9107	3/1R	3/3	P	P	P	GEAR TRAIN ASSEMBLY
9108	3/3	3/3				ALL ITEMS NOT SHOWN ON MDAC ID
9500	3/1R	3/3	P	P	P	CIRCUIT BREAKER/SWITCH
9501	3/3	3/3				ALL ITEMS NOT SHOWN ON MDAC ID

-----  
 (\*) Potential Critical Items.

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM FLIGHT: 3/1R  
MDAC ID: 9100 ABORT: 3/3

ITEM: INPUT/OUTPUT SHAFT - HOUSING  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE  
(RUPTURE)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) INPUT/OUTPUT SHAFT-HOUSING
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARTRACKER COMPARTMENT  
PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE,  
THERMAL SHOCK, ACCELERATION, VIBRATION

EFFECTS/RATIONALE:

UNABLE TO OPEN/CLOSE THE Y/Z STARTRACKER DOOR. OPEN - POSSIBLE  
LOCALIZED COMPARTMENT DAMAGE. CLOSED - LOSS OF Y/Z STARTRACKER.

REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-  
590202/9, -760709, MC452-0123, MC621-0066

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM FLIGHT: 3/1R  
MDAC ID: 9101 ABORT: 3/3

ITEM: INPUT/OUTPUT SHAFT - HOUSING  
FAILURE MODE: FAILS TO START/STOP AS COMMANDED AND ROTATES  
FREELY

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) INPUT/OUTPUT SHAFT-HOUSING
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARTRACKER COMPARTMENT  
PART NUMBER: TBD

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,  
OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE,  
THERMAL SHOCK, ACCELERATION, VIBRATION

EFFECTS/RATIONALE:

UNABLE TO OPEN/CLOSE THE Y/Z STARTRACKER DOOR. OPEN - POSSIBLE  
LOCALIZED COMPARTMENT DAMAGE. CLOSED - LOSS OF Y/Z STARTRACKER.

REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-  
590202/9, -760709, MC452-0123, MC621-0066

REPORT DATE 11/25/87

C-706

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM FLIGHT: 3/1R  
MDAC ID: 9102 ABORT: 3/3

ITEM: OPEN LIMIT SWITCHES (S1 & 3) ACTUATOR  
FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE  
OPERATION, SHORTED

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) OPEN LIMIT SWITCHES (S1 & 3) ACTUATOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARTRACKER COMPARTMENT  
PART NUMBER: S1 & 3; VS70-590202

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE,  
TEMPERATURE, ACCELERATION, VIBRATION, INADVERTENT  
OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES DOOR IS OPEN WHEN IT MAY BE CLOSED. IF THE DOOR  
IS CLOSED, OPEN CAPABILITY WOULD BE INHIBITED.

REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-  
590202/9, -760709, MC452-0123, MC621-0066

REPORT DATE 11/25/87

C-707

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM FLIGHT: 3/3  
MDAC ID: 9103 ABORT: 3/3

ITEM: STOW LIMIT SWITCHES (S1 & 3) ACTUATOR  
FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, PREMATURE  
OPERATION, OPEN (ELECTRICAL)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) OPEN LIMIT SWITCHES (S1 & 3) ACTUATOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARTRACKER COMPARTMENT  
PART NUMBER: S1 & 3; VS70-590202

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE,  
TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT  
OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES DOOR NOT OPEN WHEN IT MAY BE PROPERLY  
POSITIONED. MOTORS WOULD CONTINUE TO TURN UNTIL OFF COMMAND IS  
TRANSMITTED.

REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-  
590202/9, -760709, MC452-0123, MC621-0066

REPORT DATE 11/25/87

C-708



INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM FLIGHT: 3/3  
MDAC ID: 9104 ABORT: 3/3

ITEM: DEPLOY LIMIT SWITCHES (S2 & 4)  
FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE  
OPERATION, SHORTED

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) CLOSE LIMIT SWITCHES (S2 & 4) ACTUATOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARTRACKER COMPARTMENT  
PART NUMBER: S2 & 4; VS70-590202

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE,  
TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT  
OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES DOOR IS CLOSED WHEN IT MAY BE OPEN. IF THE DOOR  
IS OPEN, CLOSE CAPABILITY WOULD BE INHIBITED.

REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-  
590202/9, -760709, MC452-0123, MC621-0066

REPORT DATE 11/25/87

C-709

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM FLIGHT: 3/3  
MDAC ID: 9105 ABORT: 3/3

ITEM: DEPLOY LIMIT SWITCHES (S2 & 4)  
FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, PREMATURE  
OPERATION, OPEN (ELECTRICAL)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) CLOSE LIMIT SWITCHES (S2 & 4) ACTUATOR
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

FLIGHT PHASE	CRITICALITIES	
	HDW/FUNC	ABORT
PRELAUNCH:	3/3	RTLS: 3/3
LIFTOFF:	3/3	TAL: 3/3
ONORBIT:	3/3	AOA: 3/3
DEORBIT:	3/3	ATO: 3/3
LANDING/SAFING:	3/3	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARTRACKER COMPARTMENT  
PART NUMBER: S2 & 4; VS70-590202

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE,  
TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT  
OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES DOOR NOT CLOSED WHEN IT MAY BE CLOSED. MOTORS  
WOULD CONTINUE TO TURN UNTIL OFF COMMAND IS TRANSMITTED.

REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-  
590202/9, -760709, MC452-0123, MC621-0066

REPORT DATE 11/25/87

C-710

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM FLIGHT: 3/1R  
MDAC ID: 9106 ABORT: 3/3

ITEM: GEAR TRAIN ASSEMBLY  
FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,  
FRACTURE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) GEAR TRAIN ASSEMBLY
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARTRACKER COMPARTMENT  
PART NUMBER: TBD

CAUSES: CONTAMINATION, PIECE-PART FAILURE, STRUCTURAL FAILURE,  
JAMMED, FRACTURE

EFFECTS/RATIONALE:  
UNABLE TO OPEN/CLOSE STARTRACKER DOOR.

REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-  
590202/9, -760709, MC452-0123, MC621-0066

REPORT DATE 11/25/87

C-711

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM FLIGHT: 3/1R  
MDAC ID: 9107 ABORT: 3/3

ITEM: GEAR TRAIN ASSEMBLY  
FAILURE MODE: FAILS TO REMAIN IN POSITION, FREELY ROTATES

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) GEAR TRAIN ASSEMBLY
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARTRACKER COMPARTMENT  
PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, STRUCTURAL  
FAILURE, VIBRATION, OVERLOAD

EFFECTS/RATIONALE:  
UNABLE TO OPEN/CLOSE STARTRACKER DOOR.

REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-  
590202/9, -760709, MC452-0123, MC621-0066

REPORT DATE 11/25/87

C-712

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM FLIGHT: 3/3  
MDAC ID: 9108 ABORT: 3/3

ITEM: ALL ITEMS NOT SHOWN ON MDAC ID 9100-9107  
FAILURE MODE: ALL FAILURE MODES

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) ALL REMAINING PARTS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARTRACKER COMPARTMENT  
PART NUMBER: ALL PARTS NOT SHOWN ON MDAC ID 9100-9107

CAUSES: ALL CAUSES

EFFECTS/RATIONALE:

FAILURE OF ALL PARTS NOT SHOWN ON MDAC ID 9100-9107 WILL HAVE NO  
EFFECT ON MISSION, VEHICLE OR CREW.

REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-  
590202/9, -760709, MC452-0123, MC621-0066

REPORT DATE 11/25/87

C-713

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM/EPD&C FLIGHT: 3/1R  
MDAC ID: 9500 ABORT: 3/3

ITEM: CIRCUIT BREAKER/SWITCH  
FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, STRUCTURAL  
FAILURE, PREMATURE OPERATION, OPEN (ELECTRICAL)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) CIRCUIT BREAKER/SWITCH
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

	CRITICALITIES			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3	
ONORBIT:	3/1R	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 06, 014/5  
PART NUMBER: S4-Y, S5-Z, CB 26/7

CAUSES: OVERLOAD, STRUCTURAL FAILURE, TEMPERATURE, VIBRATION,  
INADVERTENT OPERATION/ACTIVATION

EFFECTS/RATIONALE:  
UNABLE TO OPEN THE Y/Z STARTRACKER DOOR.

REFERENCES: SSSH DWG. NO. 2.4 SHEET 1-3, 9.6 SHEET 1, VS70-  
590202/9, -760709

INDEPENDENT ORBITER ASSESSMENT  
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC  
SUBSYSTEM: MECH/SDM/EPD&C FLIGHT: 3/3  
MDAC ID: 9501 ABORT: 3/3

ITEM: ALL ITEMS NOT SHOWN ON MDAC ID 9500  
FAILURE MODE: ALL FAILURE MODES

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) ALL REMAINING PARTS
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ALL  
PART NUMBER: ALL PARTS NOT SHOWN ON MDAC ID 9500

CAUSES: ALL CAUSES

EFFECTS/RATIONALE:

FAILURE OF ALL PARTS NOT SHOWN ON MDAC ID 9500 WILL HAVE NO  
EFFECT ON MISSION, VEHICLE OR CREW.

REFERENCES: SSSH DWG. NO. 2.4 SHEET 1-3, 9.6 SHEET 1, VS70-  
590202/9, -760709





APPENDIX D  
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
-----	-----	-----	-----
1101	3/1R	MOTOR	FAILS TO OPERATE
1102	3/1R	GEARBOX	JAMMED
1103	3/1R	GEARBOX	BROKEN GEAR
1104	3/1R	PRESSURE LINE	LEAKAGE
1105	3/1R	PROBE	JAMMED
1106	3/1R	PROBE	CLOGGED PORT
1107	3/1R	SHAFT	BROKEN
1108	3/1R	SHAFT	BENT
1500	3/1R	+28V CONTACT #1	FAILS SHORTED
1501	3/1R	+28V CONTACT #1	FAILS OPEN
1502	3/1R	+28V CONTACT #2	FAILS SHORTED
1503	3/1R	+28V CONTACT #2	FAILS OPEN
1504	3/1R	+28V CONTACT #3	FAILS SHORTED
1505	3/1R	+28V CONTACT #3	FAILS OPEN
1506	3/1R	+28V CONTACT #4	FAILS SHORTED
1507	3/1R	+28V CONTACT #4	FAILS OPEN
1509	3/1R	+28V CONTACT #1	FAILS OPEN
1511	3/1R	+28V CONTACT #2	FAILS OPEN
1513	3/1R	+28V CONTACT #3	FAILS OPEN
1515	3/1R	+28V CONTACT #4	FAILS OPEN
1516	3/1R	+28V CONTACT #1	FAILS SHORTED
1518	3/1R	+28V CONTACT #2	FAILS SHORTED
1520	3/1R	+28V CONTACT #3	FAILS SHORTED
1522	3/1R	+28V CONTACT #4	FAILS SHORTED
1524	3/1R	+28V CONTACT #1	FAILS SHORTED
1526	3/1R	+28V CONTACT #2	FAILS SHORTED
1532	3/1R	+28V CONTACT #1	FAILS SHORTED
1533	3/1R	+28V CONTACT #1	FAILS OPEN
1534	3/1R	+28V CONTACT #2	FAILS SHORTED
1535	3/1R	+28V CONTACT #2	FAILS OPEN
1536	3/1R	+28V CONTACT #3	FAILS SHORTED
1537	3/1R	+28V CONTACT #3	FAILS OPEN
1538	3/1R	+28V CONTACT #4	FAILS SHORTED
1539	3/1R	+28V CONTACT #4	FAILS OPEN
1541	3/1R	+28V CONTACT #1	FAILS OPEN
1543	3/1R	+28V CONTACT #2	FAILS OPEN
1545	3/1R	+28V CONTACT #3	FAILS OPEN
1547	3/1R	+28V CONTACT #4	FAILS OPEN
1548	3/1R	+28V CONTACT #1	FAILS SHORTED
1550	3/1R	+28V CONTACT #2	FAILS SHORTED
1552	3/1R	+28V CONTACT #3	FAILS SHORTED
1554	3/1R	+28V CONTACT #4	FAILS SHORTED
1556	3/1R	+28V CONTACT #1	FAILS SHORTED
1558	3/1R	+28V CONTACT #2	FAILS SHORTED
1564	3/1R	INVERTED AND GATE	FAILS SHORTED

APPENDIX D  
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
-----	-----	-----	-----
1565	3/1R	INVERTED AND GATE	FAILS OPEN
1566	3/1R	INVERTED AND GATE	FAILS SHORTED
1567	3/1R	INVERTED AND GATE	FAILS OPEN
1568	3/1R	INVERTED AND GATE	FAILS SHORTED
1570	3/1R	INVERTED AND GATE	FAILS SHORTED
1572	3/1R	RELAY DRIVER	FAILS SHORTED
1573	3/1R	RELAY DRIVER	FAILS OPEN
1574	3/1R	RELAY DRIVER	FAILS SHORTED
1575	3/1R	RELAY DRIVER	FAILS OPEN
1576	3/1R	RELAY DRIVER	FAILS SHORTED
1578	3/1R	RELAY DRIVER	FAILS SHORTED
1580	3/1R	RELAY	FAILS SHORTED
1581	3/1R	RELAY	FAILS OPEN
1582	3/1R	RELAY	FAILS SHORTED
1583	3/1R	RELAY	FAILS OPEN
1584	3/1R	RELAY	FAILS SHORTED
1586	3/1R	RELAY	FAILS SHORTED
1589	3/1R	AND GATE	FAILS OPEN
1591	3/1R	TIME DELAY	FAILS OPEN
1593	3/1R	SOLID STATE DRIVER	FAILS OPEN
1595	3/1R	REMOTE PWR CNTRLR	FAILS OPEN
1597	3/1R	REMOTE PWR CNTRLR	FAILS OPEN
1599	3/1R	REMOTE PWR CNTRLR	FAILS OPEN
1601	3/1R	SWITCH RELAY	FAILS OPEN
1603	3/1R	LATCH RELAY	FAILS OPEN
1605	3/1R	EMI FILTER	FAILS OPEN
1607	3/1R	OP AMP	FAILS OPEN
1609	3/1R	REGULATOR	FAILS OPEN
1610	3/1R	GENERATOR	FAILS SHORTED
1611	3/1R	GENERATOR	FAILS OPEN
1612	3/1R	CLOCK	FAILS SHORTED
1613	3/1R	CLOCK	FAILS OPEN
1615	3/1R	+Q TRANSISTOR	FAILS OPEN
1617	3/1R	-Q TRANSISTOR	FAILS OPEN
1619	3/1R	TRANSFORMER	FAILS SHORTED
1621	3/1R	+10V AMP	FAILS OPEN
1623	3/1R	-10V AMP	FAILS OPEN
1625	3/1R	+10V TRANSISTOR	FAILS OPEN
1627	3/1R	-10V TRANSISTOR	FAILS OPEN
1629	3/1R	PWR SUPPLY TEST AMP	FAILS OPEN
1637	3/1R	FLD EFFECT TRNSSTR	FAILS OPEN
1639	3/1R	CONTROL CIRCUIT	FAILS OPEN
1640	3/1R	READ ONLY MEMORY	FAILS SHORTED
1641	3/1R	READ ONLY MEMORY	FAILS OPEN
1645	3/1R	AMP	FAILS OPEN

APPENDIX D  
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
-----	-----	-----	-----
1647	3/1R	TRANSISTOR	FAILS OPEN
1648	3/1R	AND GATE	FAILS SHORTED
1649	3/1R	AND GATE	FAILS OPEN
1650	3/1R	SRL SHFT REGISTER	FAILS SHORTED
1651	3/1R	SRL SHFT REGISTER	FAILS OPEN
1652	3/1R	BINARY COUNTER	FAILS SHORTED
1653	3/1R	BINARY COUNTER	FAILS OPEN
1654	3/1R	ADDRESSABLE SWITCH	FAILS SHORTED
1655	3/1R	ADDRESSABLE SWITCH	FAILS OPEN
1656	3/1R	AMP	FAILS SHORTED
1657	3/1R	AMP	FAILS OPEN
1658	3/1R	SWITCHING LADDER	FAILS SHORTED
1659	3/1R	SWITCHING LADDER	FAILS OPEN
1660	3/1R	POLARITY DETECTOR	FAILS SHORTED
1661	3/1R	POLARITY DETECTOR	FAILS OPEN
1662	3/1R	CONTROL LOGIC	FAILS SHORTED
1663	3/1R	CONTROL LOGIC	FAILS OPEN
1664	3/1R	REGISTER	FAILS SHORTED
1665	3/1R	REGISTER	FAILS OPEN
1666	3/1R	DISCREET INPUT BFFR	FAILS SHORTED
1667	3/1R	DISCREET INPUT BFFR	FAILS OPEN
1668	3/1R	SRL/PRLLEL CNVRTR	FAILS SHORTED
1669	3/1R	SRL/PRLLEL CNVRTR	FAILS OPEN
1670	3/1R	OSCILLATOR	FAILS SHORTED
1671	3/1R	OSCILLATOR	FAILS OPEN
1672	3/1R	2 MH2 CLOCK	FAILS SHORTED
1673	3/1R	2 MH2 CLOCK	FAILS OPEN
1674	3/1R	1 MH2 CLOCK	FAILS SHORTED
1675	3/1R	1 MH2 CLOCK	FAILS OPEN
1676	3/1R	500 MH2 CLOCK	FAILS SHORTED
1677	3/1R	500 MH2 CLOCK	FAILS OPEN
1678	3/1R	COUNTER	FAILS SHORTED
1679	3/1R	COUNTER	FAILS OPEN
1680	3/1R	OR GATE	FAILS SHORTED
1681	3/1R	OR GATE	FAILS OPEN
1682	3/1R	SENSOR WINDOW GNRTR	FAILS SHORTED
1683	3/1R	SENSOR WINDOW GNRTR	FAILS OPEN
1684	3/1R	BUFFER	FAILS SHORTED
1685	3/1R	BUFFER	FAILS OPEN
1686	3/1R	OUTPUT CONTROL	FAILS SHORTED
1687	3/1R	OUTPUT CONTROL	FAILS OPEN
1688	3/1R	ENCODER	FAILS SHORTED
1689	3/1R	ENCODER	FAILS OPEN
1690	3/1R	AMP	FAILS SHORTED
1691	3/1R	AMP	FAILS OPEN

APPENDIX D  
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
1692	3/1R	CPU	FAILS SHORTED
1693	3/1R	CPU	FAILS OPEN
1694	3/1R	SELECTOR LOGIC	FAILS SHORTED
1695	3/1R	SELECTOR LOGIC	FAILS OPEN
1696	3/1R	READ ONLY MEMORY	FAILS SHORTED
1697	3/1R	ROM	FAILS OPEN
1698	3/1R	READ/WRITE MEMORY	FAILS SHORTED
1699	3/1R	READ/WRITE MEMORY	FAILS OPEN
2100	1/1	ROD ASSEMBLY	PHYSICAL BINDING/JAMMING
2101	1/1	ROD ASSEMBLY	PHYSICAL BINDING/JAMMING
2102	1/1	BELLCRANK	PHYSICAL BINDING/JAMMING
2103	1/1	BELLCRANK	PHYSICAL BINDING/JAMMING
2104	1/1	BOLT	PHYSICAL BINDING/JAMMING
2105	1/1	BOLT	PHYSICAL BINDING/JAMMING
3101	2/1R	CENTERLINE LTCH MTR	FAILS TO START
3102	2/1R	CNTRLN MTR CLUTCH	FAILS TO ENGAGE
3105	2/1R	CENTERLINE MTR BRK	FAILS TO DISENGAGE
3106	1/1	CNTRLN LTCH DFFRNTL	PHYSICAL BINDING/JAMMING
3107	1/1	CNTRLN LTCH DFFRNTL	PARTIAL OUTPUT
3108	1/1	CENTERLINE LATCH	PHYSICAL BINDING/JAMMING
3109	2/1R	CENTERLINE LATCH	PREMATURE OPERATION
3111	2/1R	DOOR CLOSURE MTR	FAILS TO START
3112	2/1R	DOOR CLOSURE MTR	FAILS TO ENGAGE
3115	2/1R	DOOR CLOSURE MTR	FAILS TO DISENGAGE
3116	1/1	TORQUE LMT CLTCH	PHYSICAL BINDING/JAMMING
3117	1/1	TORQUE LMT CLTCH	PARTIAL OUTPUT
3118	1/1	DOOR LINKAGE ASSY	PHYSICAL BINDING/JAMMING
3119	1/1	DOOR LINKAGE ASSY	LINKAGE BROKEN/UNATTACHED
3120	1/1	HNGE LINKAGE ASSY	PHYSICAL BINDING/JAMMING
3121	1/1	HNGE LINKAGE ASSY	LINKAGE BROKEN/UNATTACHED
3122	1/1	DOOR CLOSURE TORQ	PHYSICAL BINDING/JAMMING
3123	1/1	DOOR CLOSURE TORQ	TORQUE TUBE BROKEN
3124	2/1R	DOOR CLOSURE LMT	PREMATURE OPERATION
3126	1/1	DOOR HINGE	PHYSICAL BINDING/JAMMING
3127	1/1	DOOR HINGE	STRUCTURAL FAILURE
3128	1/1	DOOR UPLATCH RLLR	BRKN OFF DOOR
3129	1/1	UMBILICAL DOOR	DAMAGED ON ASCENT
3130	2/1R	UPLOCK LATCH MTR	FAILS TO START
3131	2/1R	UPLATCH MTR CLTCH	FAILS TO ENGAGE
3134	2/1R	UPLATCH MOTOR BRK	FAILS TO DISENGAGE
3135	1/1	TRQ LIMIT CLTCH	PHYSICAL BINDING/JAMMING
3136	1/1	TRQ LIMIT CLTCH	PARTIAL OUTPUT
3137	1/1	UPLATCH TRQ TUBE	PHYSICAL BINDING/JAMMING
3138	1/1	UPLATCH TRQ TUBE	TORQUE TUBE BROKEN
3139	1/1	INBOARD UPLCK LTCH	PHYSICAL BINDING/JAMMING

APPENDIX D  
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
3140	1/1	INBOARD UPLCK LTCH	BROKEN/UNATTACHED
3141	1/1	UPLOCK LATCH MECH	PHYSICAL BINDING/JAMMING
3142	1/1	UPLOCK LATCH MECH	BROKEN/UNATTACHED
3143	2/1R	READY TO LATCH LMT	PREMATURE OPERATION
3501	2/1R	RELAY	FAILS TO CLOSE
3503	2/1R	RELAY	FAILS TO CLOSE
3507	2/1R	CNTLRN LTCH-STOW	FAILS TO SWITCH
3509	2/1R	ET UMBILICAL DR	FAILS TO SWITCH
3511	2/1R	ET UMBILICAL DR	FAILS TO SWITCH
3512	2/1R	ET UMBILICAL DR	FAILS TO SWITCH
3514	2/1R	ET UMBILICAL DR	FAILS TO SWITCH
3515	2/1R	CONTROL BUS FUSE	FAILS OUT OF TOL
3516	2/1R	MCA AC PWR CRCT	FAILS OUT OF TOL
3517	2/1R	MCA RELAY LGC PWR	FAILS OFF
3519	2/1R	REMOTE PWR CNTRLR	FAILS OFF
3522	2/1R	DIODE	OPEN CIRCUIT
3524	2/1R	RESISTOR, 5.1K 1/4W	SHORTS
3525	2/1R	RESISTOR, 5.1K 1/4W	OPEN CIRCUIT
3526	2/1R	RESISTOR, 5.1K 1/4W	RESISTANCE HIGHER
3527	2/1R	FUSE, 1A	BLOWN
3528	2/1R	RESISTOR, 1.2K	SHORTS
3529	2/1R	RESISTOR, 1.2K	OPEN CIRCUIT
4101	1/1	GLLTN/PRSSR CRTRDG	FAILS MID-TRAVEL
4102	2/2	GLLTN/PRSSR CRTRDG	PREMATURE OPERATION
4103	1/1	NUT/BREECH	INTL/EXTL LEAKAGE
4104	1/1	NUT/BREECH	PREMATURE OPERATION
4105	2/1R	INPUT/OUTPUT SHAFT	PHYSICAL BNDNG/JAM
4106	2/1R	INPUT/OUTPUT SHAFT	FAILS TO START/STOP
4109	2/1R	DEPLOY LIMIT SWTCH	FAILS TO REMAIN OPEN
4110	2/1R	DEPLOY LIMIT SWTCH	FAILS TO REMAIN CLSD
4111	2/1R	GEAR TRAIN ASSY	PHYSICAL BINDING/JAM
4112	2/1R	GEAR TRAIN ASSY	FAILS TO RMN IN PSTN
4508	3/2R	+28V CONTACT #1	FAILS SHORTED
4509	3/1R	+28V CONTACT #1	FAILS OPEN
4510	3/2R	+28V CONTACT #2	FAILS SHORTED
4511	3/1R	+28V CONTACT #2	FAILS OPEN
4512	3/2R	+28V CONTACT #3	FAILS SHORTED
4513	3/1R	+28V CONTACT #3	FAILS OPEN
4514	3/2R	+28V CONTACT #4	FAILS SHORTED
4515	3/1R	+28V CONTACT #4	FAILS OPEN
4516	3/1R	+28V CONTACT #1	FAILS SHORTED
4517	3/2R	+28V CONTACT #1	FAILS OPEN
4518	3/1R	+28V CONTACT #2	FAILS SHORTED
4519	3/2R	+28V CONTACT #2	FAILS OPEN
4520	3/1R	+28V CONTACT #3	FAILS SHORTED

APPENDIX D  
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
4521	3/2R	+28V CONTACT #3	FAILS OPEN
4522	3/1R	+28V CONTACT #4	FAILS SHORTED
4523	3/2R	+28V CONTACT #4	FAILS OPEN
4525	3/2R	+28V CONTACT #1	FAILS OPEN
4527	3/2R	+28V CONTACT #2	FAILS OPEN
4529	3/2R	+28V CONTACT #3	FAILS OPEN
4531	3/2R	+28V CONTACT #4	FAILS OPEN
4532	3/2R	+28V CONTACT #1	FAILS SHORTED
4533	3/1R	+28V CONTACT #1	FAILS OPEN
4534	3/2R	+28V CONTACT #2	FAILS SHORTED
4535	3/1R	+28V CONTACT #2	FAILS OPEN
4536	3/2R	+28V CONTACT #3	FAILS SHORTED
4537	3/1R	+28V CONTACT #3	FAILS OPEN
4538	3/2R	+28V CONTACT #4	FAILS SHORTED
4539	3/1R	+28V CONTACT #4	FAILS OPEN
4543	3/2R	AND GATE #1	FAILS SHORTED
4544	3/1R	AND GATE #1	FAILS OPEN
4545	3/2R	AND GATE #2	FAILS SHORTED
4546	3/1R	AND GATE #2	FAILS OPEN
4547	3/1R	AND GATE #1	FAILS SHORTED
4548	3/2R	AND GATE #1	FAILS OPEN
4549	3/1R	AND GATE #2	FAILS SHORTED
4550	3/2R	AND GATE #2	FAILS OPEN
4551	3/2R	AMP #1	FAILS SHORTED
4552	3/1R	AMP #1	FAILS OPEN
4553	3/2R	AMP #2	FAILS SHORTED
4554	3/1R	AMP #2	FAILS OPEN
4555	3/1R	AMP #1	FAILS SHORTED
4556	3/2R	AMP #1	FAILS OPEN
4557	3/1R	AMP #2	FAILS SHORTED
4558	3/2R	AMP #2	FAILS OPEN
4559	3/2R	K14	FAILS SHORTED
4560	3/1R	K14	FAILS OPEN
4561	3/2R	K68	FAILS SHORTED
4562	3/1R	K68	FAILS OPEN
4563	3/1R	K72	FAILS SHORTED
4564	3/2R	K72	FAILS OPEN
4565	3/1R	K70	FAILS SHORTED
4566	3/2R	K70	FAILS OPEN
4567	3/1R	STW MCRSWITCH #1	FAILS SHORTED
4569	3/2R	DPLY MCRSWTCH #1	FAILS SHORTED
4571	3/2R	AND GATE #1	FAILS SHORTED
4572	3/1R	AND GATE #1	FAILS OPEN
4573	3/2R	AND GATE #2	FAILS SHORTED
4574	3/1R	AND GATE #2	FAILS OPEN

APPENDIX D  
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
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4575	3/1R	AND GATE #1	FAILS SHORTED
4576	3/2R	AND GATE #1	FAILS OPEN
4577	3/1R	AND GATE #2	FAILS SHORTED
4578	3/2R	AND GATE #2	FAILS OPEN
4579	3/2R	AMP #1	FAILS SHORTED
4580	3/1R	AMP #1	FAILS OPEN
4581	3/2R	AMP #2	FAILS SHORTED
4582	3/1R	AMP #2	FAILS OPEN
4583	3/1R	AMP #1	FAILS SHORTED
4584	3/2R	AMP #1	FAILS OPEN
4585	3/1R	AMP #2	FAILS SHORTED
4586	3/2R	AMP #2	FAILS OPEN
4587	3/2R	K25	FAILS SHORTED
4588	3/1R	K25	FAILS OPEN
4589	3/2R	K2	FAILS SHORTED
4591	3/1R	K2	FAILS OPEN
4592	3/1R	K27	FAILS SHORTED
4593	3/2R	K27	FAILS OPEN
4594	3/1R	K37	FAILS SHORTED
4595	3/2R	K37	FAILS OPEN
4596	3/1R	STW MCRSWITCH #2	FAILS SHORTED
4598	3/2R	DPLY MCRSWITCH #2	FAILS SHORTED
4600	3/1R	+28V CONTACT #1	FAILS SHORTED
4601	3/1R	+28V CONTACT #1	FAILS OPEN
4602	3/1R	+28V CONTACT #2	FAILS SHORTED
4603	3/1R	+28V CONTACT #2	FAILS OPEN
4604	3/1R	+28V CONTACT #3	FAILS SHORTED
4605	3/1R	+28V CONTACT #3	FAILS OPEN
4606	3/1R	+28V CONTACT #4	FAILS SHORTED
4607	3/1R	+28V CONTACT #4	FAILS OPEN
4616	3/1R	+28V CONTACT #1	FAILS SHORTED
4617	3/1R	+28V CONTACT #1	FAILS OPEN
4618	3/1R	+28V CONTACT #2	FAILS SHORTED
4619	3/1R	+28V CONTACT #2	FAILS OPEN
4624	3/1R	AND GATE #1	FAILS SHORTED
4625	3/1R	AND GATE #1	FAILS OPEN
4626	3/1R	AND GATE #2	FAILS SHORTED
4627	3/1R	AND GATE #2	FAILS OPEN
4628	3/1R	40 MS TIME DELAY	FAILS SHORTED
4629	3/1R	40 MS TIME DELAY	FAILS OPEN
4630	3/1R	AMP #1	FAILS SHORTED
4631	3/1R	AMP #1	FAILS OPEN
4632	3/1R	AND GATE #3	FAILS SHORTED
4633	3/1R	AND GATE #3	FAILS OPEN
4634	3/1R	4 SECOND TIME DELAY	FAILS SHORTED

APPENDIX D  
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
4635	3/1R	4 SECOND TIME DELAY	FAILS OPEN
4636	3/1R	AMP #3	FAILS SHORTED
4637	3/1R	AMP #3	FAILS OPEN
4638	3/1R	EXPLOSIVE INITIATOR	FAILS SHORTED
4639	3/1R	EXPLOSIVE INITIATOR	FAILS OPEN
4640	3/1R	EXPLOSIVE INITIATOR	FAILS SHORTED
4641	3/1R	EXPLOSIVE INITIATOR	FAILS OPEN
4642	3/1R	AND GATE #1	FAILS SHORTED
4643	3/1R	AND GATE #1	FAILS OPEN
4644	3/1R	AND GATE #2	FAILS SHORTED
4645	3/1R	AND GATE #2	FAILS OPEN
4646	3/1R	40 MS TIME DELAY	FAILS SHORTED
4647	3/1R	40 MS TIME DELAY	FAILS OPEN
4648	3/1R	AMP #1	FAILS SHORTED
4649	3/1R	AMP #1	FAILS OPEN
4650	3/1R	AND GATE #3	FAILS SHORTED
4651	3/1R	AND GATE #3	FAILS OPEN
4652	3/1R	4 SECOND TIME DELAY	FAILS SHORTED
4653	3/1R	4 SECOND TIME DELAY	FAILS ON
4654	3/1R	AMP #3	FAILS SHORTED
4655	3/1R	AMP #3	FAILS OPEN
4656	3/1R	EXPLOSIVE INITIATOR	FAILS SHORTED
4657	3/1R	EXPLOSIVE INITIATOR	FAILS OPEN
4658	3/1R	EXPLOSIVE INITIATOR	FAILS SHORTED
4659	3/1R	EXPLOSIVE INITIATOR	FAILS OPEN
4660	3/1R	AMP #2	FAILS SHORTED
4661	3/1R	AMP #2	FAILS OPEN
4662	3/1R	AMP #2	FAILS SHORTED
4663	3/1R	AMP #2	FAILS OPEN
4664	3/1R	CONVERTER	FAILS SHORTED
4665	3/1R	CONVERTER	FAILS OPEN
4666	3/1R	INVERTED AND GATE	FAILS SHORTED
4667	3/1R	INVERTED AND GATE	FAILS OPEN
4668	3/1R	CAPACITOR BANK	FAILS SHORTED
4669	3/1R	CAPACITOR BANK	FAILS OPEN
4670	3/1R	AND GATE	FAILS SHORTED
4671	3/1R	AND GATE	FAILS OPEN
4674	3/1R	TEST LOGIC	FAILS SHORTED
4675	3/1R	TEST LOGIC	FAILS OPEN
4676	3/1R	CONVERTER	FAILS SHORTED
4677	3/1R	CONVERTER	FAILS OPEN
4678	3/1R	INVERTED AND GATE	FAILS SHORTED
4679	3/1R	INVERTED AND GATE	FAILS OPEN
4680	3/1R	CAPACITOR BANK	FAILS SHORTED
4681	3/1R	CAPACITOR BANK	FAILS OPEN



APPENDIX D  
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
4682	3/1R	AND GATE	FAILS SHORTED
4683	3/1R	AND GATE	FAILS OPEN
4686	3/1R	TEST LOGIC	FAILS SHORTED
4687	3/1R	TEST LOGIC	FAILS OPEN
5101	2/1R	CNTRLN/BLKHD LTH MTR	LOSS OF OUTPUT
5102	2/1R	CNTRLN/BLKHD LTH MTR	FAILS TO ENGAGE
5104	2/1R	CNTRLN/BLKHD LTH MTR	FAILS TO DISENGAGE
5106	2/1R	CNTRLN/BLKHD LTH MTR	SLIPS
5107	1/1	CNTRLN/BLKHD LTH GNG	LOSS OF OUTPUT
5108	2/1R	CNTRLN/BLKHD LTH GNG	PARTIAL OUTPUT
5109	1/1	CNTRLN/BLKHD LTH GNG	PHYSICAL BINDING/JAM
5110	1/1	CNTRLN/BLKHD TRQ LMT	FAILS TO OPERATE
5111	1/1	CNTRLN/BLKHD TRQ LMT	FAILS OUT OF TOL
5112	1/1	CNTRLN/BLKHD TRQ LMT	FAILS OUT OF TOL
5113	1/1	CNTRLN/BLKHD GRBX	FAILS TO TRNSFR MTR
5114	1/1	CNTRLN/BLKHD GRBX	PHYSICAL BINDING/JAM
5115	1/1	CNTRLN/BLKHD GRBX	PARTIAL OUTPUT
5119	2/1R	CNTRLN/BLKHD CLS LMT	PREMATURE OPERATION
5120	1/1	CNTRLN LTCH GNG TRQ	BROKEN
5121	1/1	CNTRLN LTCH GNG TRQ	PHYSICAL BINDING/JAM
5122	1/1	CNTRLN LTCH ASSY	PHYSICAL BINDING/JAM
5123	2/1R	CNTRLN LTCH ASSY	BROKEN COMPONENT
5125	2/1R	CNTRLN LTCH RLLR	PHYSICAL BINDING/JAM
5127	2/1R	PBD SHEAR FTTNG RLLR	FAILS TO ENGAGE CLAW
5128	2/1R	PBD SHEAR FTTNG RLLR	BROKEN
5129	2/1R	PBD SHEAR FTTNG RLIR	PHYSICAL BINDING/JAM
5130	2/1R	PBD SHEAR FTTNG CLAW	FAILS TO ENGAGE ROLLER
5131	2/1R	PBD SHEAR FTTNG CLAW	BROKEN
5132	2/1R	PBD SHEAR FTTNG CLAW	BENT
5133	2/1R	BLKHD LATCH GANG	PHYSICAL BINDING/JAM
5134	2/1R	BLKHD LATCH GANG	BROKEN
5135	2/1R	BLKHD PSH-PLL RD	PHYSICAL BINDING/JAM
5136	2/1R	BLKHD PSH-PLL RD	BROKEN
5137	2/1R	BLKHD LTCH LNK	PHYSICAL BINDING/JAM
5138	2/1R	BLKHD LTCH LNK	BROKEN
5139	2/1R	BLKHD LTCH LNK	FAILS TO LATCH
5140	2/1R	BLKHD RLLR ASSY	PHYSICAL BINDING/JAM
5143	2/1R	BLKHD DR CLSD SWCH	PREMATURE OPERATION
5145	2/1R	BLKHD RDY-TO-LTCH SW	PREMATURE OPERATION
5146	2/1R	PYLD BY DR DRV MTR	LOSS OF OUTPUT
5147	2/1R	PYLD BY DR DRV CL	FAILS TO ENGAGE
5149	2/1R	PYLD BY DR DRV BK	FAILS TO DISENGAGE
5151	2/1R	PYLD BY DR DRV CL	SLIPS
5152	1/1	PYLD BY DR DRV	LOSS OF OUTPUT
5153	2/2	PYLD BY DR DRV	PARTIAL OUTPUT

5154	1/1	PYLD BY DR DRV	PHYSICAL BINDING/JAM
5155	1/1	PYLD BY DR DRV	FAILS TO OPERATE
5156	1/1	PYLD BY DR DRV	PHYSICAL BINDING/JAM
5157	2/2	PYLD BY DR DRV	PARTIAL OUTPUT
5158	1/1	PYLD BY DR DRV	BROKEN
5159	2/1R	PYLD BY DR DRVS	SEIZED BEARING
5160	1/1	PYLD BY DR DRV	PHYSICAL BINDING/JAM
5161	1/1	PYLD BY DR DRV	BROKEN SUPPORT SHAFT
5163	1/1	PYLD BY DR DRVR	FAILS OUT OF TOL
5164	1/1	PYLD BY DR DRVR	TORQUE LIMITER FAILS
5165	1/1	PYLD BY DR DRVR	JAMMED ROTARY ACT
5166	1/1	PYLD BY DR DRV	ROTARY ACTUATOR OUTPUT
5167	2/1R	PYLD BY DR DRVR	BROKEN MOUNTING BRACKET
5168	1/1	PYLD BY DR DRV	PHYSICAL BINDING/JAM
5174	1/1	PAYLOAD BAY DOOR	WARPED
5175	1/1	PAYLOAD BAY DOOR	DAMAGED PANEL
5176	2/1R	PAYLOAD BAY DOOR	PHYSICAL BINDING/JAM
5501	2/1R	CONTROL BUS 1.2K	SHORTS
5502	2/1R	CONTROL BUS 1.2K	OPEN CIRCUIT
5503	2/1R	CONTROL BUS 1.2K	RESISTANCE HIGHER
5504	2/1R	PAYLOAD BAY DOOR	FAILS TO SWITCH
5505	2/1R	FUSE, 1A	OPEN
5506	2/1R	PAYLOAD BAY DOOR	FAILS TO SWITCH
5507	2/1R	MAIN DC BUS RELAY	FAILS TO CLOSE
5511	2/1R	SWITCH RESISTOR	SHORTS
5513	2/1R	SWITCH RESISTOR	RESISTANCE HIGHER
5514	2/1R	PAYLOAD BAY DOOR	FAILS TO CLOSE
5515	2/1R	PAYLOAD BAY DOOR	FAILS TO OPEN
5516	2/1R	MCA AC POWER CRCT	OPEN
5517	2/1R	MCA RELAY LOGIC PWR	FAILS OFF
5519	2/1R	REMOTE POWER CNTRLR	FAILS OFF
7100	3/1R	PRESSURE PORT	CLOGGED
7101	1/1	PRESSURE PORT	LEAKAGE
7102	3/1R	O RING	LEAKAGE
7103	3/1R	O RING	CRACKED
7104	3/1R	VIEWPORT	LEAKAGE
7106	3/1R	ACTUATOR	BROKEN GEAR
7107	3/1R	ACTUATOR	BROKEN SHAFT
7108	3/1R	ACTUATOR	JAMMED
7109	3/2R	ACTUATOR	BROKEN GEAR
7110	3/2R	ACTUATOR	BROKEN SHAFT
7111	3/2R	ACTUATOR	JAMMED
7112	3/1R	O RING	CRACKED
7113	3/1R	O RING	LEAKAGE
7114	3/1R	VIEWPORT	LEAKAGE
8100	2/1R	ROD ASSEMBLY	PHYSICAL BINDING/JAM
8101	2/1R	BELLCRANK	PHYSICAL BINDING/JAM
8102	2/1R	BOLT/BRACKET/DBLR	PHYSICAL BINDING/JAM
8103	2/1R	INPUT/OUTPUT TRQ	PHYSICAL BINDING/JAM
8104	2/1R	INPUT/OUTPUT TRQ	FAILS TO START/STOP
8105	2/1R	DIFFERENTIAL/GEAR	PHYSICAL BINDING/JAM
8106	2/1R	DIFFERENTIAL/GEAR	FAILS TO REMAIN IN POS

APPENDIX D  
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
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8107	2/1R	MCRSWTCH PSTN IND	FAILS TO REMAIN OPEN
8108	2/1R	MCRSWTCH PSTN IND	FAILS TO REMAIN CLOSED
8501	2/1R	ACTUATOR MOTOR	PREMATURE OPERATION
8502	2/1R	ACTUATOR SWTCH MDL	OPEN
8503	2/1R	MCA AC POWER RELAY	PARTIAL OUTPUT
8504	2/1R	MCA PURGE SGNL DRVR	ERRONEOUS OUTPUT
8505	2/1R	MCA DC POWER BUS	OPEN
8506	2/1R	MCA AC POWER BUS	OPEN
8507	2/1R	MCA DIODE	OPEN
8508	2/1R	MCA DIODE	SHORTED
8509	2/1R	ELECTRICAL CON	OPEN
8510	2/1R	CABLES/WIRING	OPEN
8511	2/1R	MOD/DEMOM	DELAYED OPERATION
8512	2/1R	MOD/DEMOM	INADVERTENT OPERATION
8513	2/1R	GPC SOFTWARE	INADVERTENT OPERATION
8514	2/1R	FUSE	OPEN
8515	2/1R	RESISTOR	SHORTED
8516	2/1R	RESISTOR	OPEN
8517	2/1R	GPC SOFTWARE	DELAYED OPERATION

